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of the

FIELD NATURALISTS CLUB OF VICTORIA

VOL. 70

MAY, 1953, TO APRIL, 1954

Hon. Editor : N. A. Wakefield

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MONTHLY MEETINGS AND LECTURES

1953

- May 11—Presidential address: "Structure of Eucalypt Bark"
MARGARET M. CHATTAWAY
- June 8—Annual Meeting and Election of Office-bearers.
Colour Slides of Australian Wildflowers and Scenery, R. MELVILLE
- July 13—"Central Australia" INA WATSON
- August 10—"Reclamation of Desert Lands" I. CLUNIES ROSS
- September 14—"Impressions of Northern Africa" S. R. MITCHELL
- October 12—"Victorian Orchids" W. L. WILLIAMS
- November 9—"The Nature Show and Youth Education", N. A. WAKEFIELD
- December 14—"Hammersley Ranges" J. H. WILLIS
- "Rosebud Foreshores" R. J. McMAHON

1954

- January 11—Members' Night (Lecturettes by seven members).
- February 8—"Snakes" IAN WALLACE
- March 9—"A Walking Holiday on Mount Bogong and the High Plains"
JEAN BLACKBURN
- April 12—"Some North Queensland Islands" F. LEWIS

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PROCEEDINGS

The General Meeting of the Club was held at the Herbarium on April 13, 1953, with Dr. Chartaway in the chair. It was well attended by members and visitors, numbering about 105.

Mr. A. W. Burston introduced the speakers for the National Parks Symposium; and a report of the lectures may be found elsewhere in this issue.

The Secretary called for nominations for the 1953 award of the Australian Natural History Medallion, and for Club Office-bearers and Council for 1953-4.

Correspondence was read from the Entomological Society of New South Wales, inviting F.N.C.V. members to join that Society; from the C.S.I.R.O. Division of Forest Products, requesting the co-operation of Club members in research into wood-destroying fungi; from the Native Plants Preservation Society, seeking signatures to a petition for legislation to prevent the sale of wildflowers; and from the Premier of New South Wales, stating that the Kurnell reserve would not be interfered with by the oil refinery there.

On behalf of the Club, the President thanked Messrs. Lee, Fisch, Jennison and Burke for their help in the removing of the Club library from the Royal Society's Building to the Herbarium where Mr. Jessep has made a room available.

Mr. Lord spoke of the scheme for replanting Wattle Park with native trees and shrubs, and he asked members to assist by donating plants. (See list of plants needed.)

Mr. Baker announced that future meetings of the Geology Group would take place in the National Museum. Mr. Swaby made a request for information about films and slides figuring Australian plants suitable for cultivation.

March Meeting—

EXHIBITS

INSECTS: Caterpillars of the Wanderer Butterfly (Miss Pinches).

ARTEFACTS: Aboriginal artefacts from Tasmania (Mr. Miller).

MISCELLANEOUS: Three stages in the preparation of drawings of a new wasp, *Nysson portlandensis*—(a) plotting of arrangement on page, (b) pencilled outlines of wings, etc., (c) adult wasp completed in Indian ink (Mr. Rayment). Photographic views of Victorian National Parks (Miss Wigan).

BOTANY: Garden-grown flowers—Queen Ann Lace Flower (Miss E. Raff), and the native *Beaufortia sparsa* of Western Australia (Mr. F. E. Lord). The latter, known as the Swamp Brush-Myrtle, is distinguished from *Callistemon* by its branched anthers, and it flowers for about six weeks in the late summer off-season.

April Meeting—

BOTANY: *Thryptomene* Hybrid, a form originated in South Australia and proving excellent in cultivation (Mr. Seaton); *Melaleuca squamea*, *Hakea nodosa* and *Eriochilus cucullatus* (Miss Gamble); *Ranksia serrata* from Portland (Mrs. Crofts); *Astelia nervosa* from Ryson's Creek, Victoria (Dr. Chattaway); *Callistemon paludosus*, *Eriostemon gracilis* and *Melaleuca macronychia* from Botanic Gardens (Mr. Atkins); collection of N.S.W. flowers (Mr. Singleton), and garden grown flowers (Mr. Savage).

REPTILES: Colour variations of Tiger Snakes (Mr. Wallace).

MISCELLANEOUS: Photographic views of National Parks (Miss Wigan); Aboriginal woman's skull (Mrs. Carberry); Eggs of Giant Gippsland Earthworm (Mr. Lewis); Brittle Star (Mrs. Frcame).

GEOLOGY: Quartz veins traversing jasperized rocks, "Wood-opal" and banded Silurian Limestone—all from Waratah Bay (Mr. Day).

NOTICE TO EXHIBITORS

The exhibits steward and editor would be very pleased if you accompanied each exhibit by a written note stating the name of the specimen(s), source (locality) and the points of interest in connection with it, that is, the *reason* for showing it. These notes will then be valuable contributions for publication in the "Exhibits" report in the *Naturalist*. Make the exhibits a feature of each general meeting and of each issue of the journal!

NATURE NOTES

Colour variations of the Tiger Snakes (*Notechis scutatus*), exhibited at the general meeting:

1. Bands almost as broad as the interspaces; light grey above, cream below.
2. Bands narrow and interspaces broad; dark above, bright yellow below.
3. Not at all banded; olive green above, cream below. This specimen, which is above average size, was "milked" six times within 2½ hours and yielded more than sufficient venom each time to kill an adult person.

Note: Colour variations occur without correlation to local conditions.

GEOLOGY DISCUSSION GROUP

The monthly meeting of the above Group was held on April 7, with an attendance of 16.

In a report on the excursion to the Altona District held on March 7, Mr. E. D. Gill described the emerged shell beds as rising over ten feet above L.W.M., and composed of shells and calcareous sand but with little siliceous sand and clay. The beds are horizontal, with some current-bedding. The materials that make up the strata have been water-sorted, and in one bed nearly all the shells were concave-side downwards. The shellfish did not all live where their remains are now found, for those that live on rocks, those that live on weeds, and those that live on sand are buried together. Most of the species are still found in Port Phillip, but *Anadara trapezia* is very rare there, and *Nucella torquata* (found in similar beds to the Altona ones) has apparently not been taken alive on the Victorian coast.

The excursion also visited the former Brown Coal Mine at Altona where fossil wood with doubly terminated quartz crystals was obtained.

The talk for the evening was given by Mr. A. A. Baker, and entitled "Fossil Invertebrata—their Life and Form"—Mollusca, Pt. 2. This dealt with the Scaphoda (tusk shells), and Cephalopoda (nautiloids, ammonites, belemnites, squids, cuttlefish and octopuses). A description of the animal, the shell, the geologic history, and ecology was given with the aid of lantern slides and specimens.

Exhibits

- Mr. Watts—Limestone (polished) from Pt. Grinder, Waratah Bay, Vic.
- Mr. D. Jeffries—Micro. quartz crystals from Altona (under a microscope). *Cladophlebis* and *Tacniopteris* in a block of Lower Jurassic sandstone from Cape Patterson, Vic.
- Mr. E. D. Gill—Pelecypods and barnacles from a new fossil locality on the Maribyrnong River, Essendon, Vic.
- Miss B. Nielson—Collection of chitons, pelecypods, gasteropods, and a small octopus (in spirit) from Balcombe Bay, Lilydale, Torquay, etc.
- Master Phillip Bock—Collection of fossils in nodular limestone (Balcombian) from Beaumaris, Vic.

—A. A. BAKER.

"THE VICTORIAN NATURALIST"

In the production of the monthly issues of this journal, there are three main considerations. First, there are the Club activities to be placed on record, so priority is given to the monthly Proceedings, Nature Notes, Exhibits and Lecture at each general meeting, and to the reports of Group activities and Club excursions. Secondly, there are published notes and articles of popular interest, written by members of the Club for the purpose of sharing their observations and thoughts with readers of the magazine. Finally, the journal is a medium for the publication of papers embodying the results of original research in the realms of Natural History; and it is recognized as such and sought after by scientific institutions throughout the world.

The general editorial policy is to maintain the *Naturalist* in its three-fold purpose. The immediate consideration with each issue is to strike the desirable balance between scientific papers and popular articles, and between the amounts of material dealing with the various branches of Nature. As the magazine is the one link which the many Country Members have with the Club, it must be made as attractive and interesting as possible for them.

There has always been a preponderance of botanical material in the *Naturalist*, due to the great proportion of Club members interested in that science. But when a completely botanical number is issued, it is solely because there was nothing else in the editor's hands. For a more satisfactory balance, there is need for much more material dealing with geology and zoology. The Club is waiting for contributions, preferably illustrated, of articles and notes on the subjects of *your* interests. Country members are looked to in particular to record their excursions, observations, notes and questions.

If the journal pleases you, consider how you can improve it; if it displeases you, give thought to rectifying the fault; but in either case, remember that the *Victorian Naturalist* is, and always will be, what YOU make it.

NATIONAL PARKS SYMPOSIUM

Mr. A. W. Burston opened the second evening of the Symposium, and the first speaker was Mr. W. F. Waters, who gave a graphic account of the development and problems of the Kinglake National Park.

The main part of the Kinglake Park, an area of 13,800 acres, was established in 1928, due to the efforts of Sir James Barrett, William Everard, M.L.A., and Professor Laver. Soon after its inception, Professor Laver presented an additional area of 57 acres at the head of Jchosophat Valley; and in 1929 a further 86 acres was added to include the Wombelano Falls. The composite reserved area is approximately 14,000 acres, with parts in the Shires of Whittlesea, Eltham and Yea respectively. It extends from Sugarloaf Creek at Kinglake West, some 10 miles easterly to the Mt. Slide junction, and thence 6 miles south to Watson's Creek at Christmas Hills.

The McPherson Ministry gave the new Park a grant of £350, and a ranger was appointed with a house in the Sugarloaf area. The Committee of Management aims at the preservation of flora and fauna and beauty spots as well as the development of recreation facilities for tourists, walking clubs and schools. Works already carried out include the making of camping grounds and tracks to beauty spots, with a service of fireplaces, kiosks, water supplies, parking areas and other conveniences. Much assistance has been rendered by the Country Roads Board and the Public Works Department, as well as by the various Shire Councils.

Revenue is quite inadequate; it is sufficient for about one-quarter of the wages of one ranger. There is a £100 grant by the Public Works Department from the Tourist Grant, and a small amount from parking and camping fees, sale of firewood, etc. Many essential works are in need of attention, mainly the establishment of tourist facilities; but the vital necessity is the provision of three rangers with suitable houses and equipment.

Mr. N. A. Wakefield spoke on the East Gippsland National Parks, and illustrated his talk with a film-strip showing maps and views of the areas concerned. First came Lind Park, on the Princes Highway, west of Cann River, a small area of attractive fern gullies. Some pictures were shown of Wingan Inlet's historic interests—Captain Cook's "Ram Head" and the landing place of George Bass. The feature of the area is the Tree Trigger-Plant which grows to six feet in height, and which is found nowhere else in Victoria. The story of Alfred Park followed, and a full report of this may be found elsewhere in this number. The talk concluded with reference to some botanical and geological features of the Howe Ranges in the Maffaccoota National Park.

PLATE I



Photo: P. Crosbie Morrison.

The Suspension Bridge in Bulga Park.



In the Wilson's Promontory National Park : Oberon Bay and Growlers Creek, with Mount Norgate in the background.



Photos: P. Crosbie Morrison.

Regeneration near Sealers Cove : A riot of Bindweed takes possession after the fire.

Mr. P. Crosbie Morrison was the final speaker in the National Parks Symposium, summing up the general situation before proceeding with an illustrative film. He agreed with what was published in the last issue of the *Naturalist* about the impossibility of conducting Parks efficiently under the present system. Mr. Morrison maintained that much of the criticism of our National Parks at present is justified, and the reason for it will not be removed until there is new legislation. First, there must be adequate finance for National Parks, independent of any revenue from camping and parking fees. (Grazing fees and firewood royalties are not included as legitimate sources of revenue for any National Park.) In so many cases, the efficiency of a National Park will be in inverse proportion to its earning capacity—the more money made out of it by public access, the less efficient it will be as an area for conservation of fauna and flora. The group that recognizes this best is the Administration of the Belgian Congo, which has probably the best National Parks policy in the world. The main aim is conservation of the complete ecological environment, and it is virtually impossible for a tourist to gain access to such an area. Entry into the conservation sections is for legitimate study only, and the interference with reptiles, fish or even insects is banned on principle. That means that the Parks are not expected to produce revenue; money is made available for their preservation intact. These Belgian Congo Parks are the largest in the world, two of them having areas of about 4,000 and 4,500 square miles, or $2\frac{1}{2}$ and 3 million acres respectively.

The second necessity for efficient National Parks maintenance is a pool of trained rangers and superintendents, with some provision for training. The present system, using old men on the basic wage or less, with no training, deserves what it gets!

On the other hand, there has been some uninformed criticism that does more harm than good. We have seen recently a very outspoken criticism of Wilson's Promontory, which, under analysis, is found to be utterly misleading. It blames the present committee of management for pre-war conditions in which most of its members had no say, and also for the recent disastrous fire which started outside the Promontory reserve and could never have been controlled with two rangers for 10,000 acres. Criticism is needed; but it must be based on correct grounds and not so obviously answerable as to induce complacency.

It is the whole wrong principle that the Victorian National Parks Association wants to change, so full support is needed for the big public inauguration planned for July 23 in the Melbourne Town Hall. The motto of the National Parks re-organization should be: *FOR ALL THE PEOPLE—ALL THE TIME.*

Mr. Morrison treated the Club to a preview of an excellent colour film which is in the making to illustrate National Parks

in Victoria. It took in the Grand Ridge Road, a visit to the swing bridge in Bulga Park, and a tour of Wilson's Promontory.



The Promontory Emus, near northern entrance to National Park.

At the northern end of the Promontory, the usual mob of emus was seen on parade, and the interesting sand movement of the "Burning Cliffs" intrigued the gathering. Darby River and Squeaky Bay came next, followed by views of the tourist accommodation and the gnarled old Banksia trees at Tidal River. Then there were scenes along the tracks round Norman Point to Oberon Bay and Growlers Creek, and of the walk right across the Promontory from Tidal River to Sealers Cove.

The film concluded with a full-circle panorama of the Tower Hill Park, and some views of the Lower Glenelg River.

VISUAL EDUCATION

Though it is billed only as a support, the film *Nature's Half-Acre* fully warrants the prominence of being featured. After viewing it, one cannot but be deeply impressed with the value of visual education in its application to the teaching of natural history.

With one exception the script is quite accurate; but the pictures themselves—of wasps, caterpillars, butterflies, bees, flowers and birds, all in action—are altogether thrilling, and the magnificent natural colours are a delight to the eye.

In five minutes, the zoology student learns more about the mechanics of the chameleon's moveable "head-lamps" than he would ever discover from pages of print. The wonders and the range of the little animal's vision are fully appreciated when one eye is seen focussed straight ahead while the other is directed to the rear; and the film makes a dramatic reality of the "shooting down" of a victim with the lizard's tongue.

Excellent and accurate photography depicts the amazing "pollen dance" of the bee even better than one could see it naturally on the honeycombs. Here a minor lapse occurs. The youngest bees, which are said to manipulate the wax into cells, are in reality the nurses that feed the brood, and they do not leave the hive until about a fortnight after emerging from the cells. This slip is small but regrettable, for complete accuracy is essential in such films if their full educational value is to be realized.

The botany student may be enthralled by the unfolding flowers, but the rolling open of golden catkins amazes him with the sheer loveliness of nature's work; and the garden lover is enraptured by the light and colour in scenes of floral and arboreal beauty.

Walt Disney appears to revel in the filming of natural history, and he associates with a number of competent naturalists. So *Nature's Half-Acre* leaves a regret that such magnificent lessons, full of truth and beauty, are not incorporated into the ordinary curriculum of the schools. It teaches simultaneously the beauty of nature, colour-harmony and light effects, as well as animal and vegetable morphology and physiology. In visual education Disney has shown us what a magnificent instrument we have for the cultivation of the mind; so it is lamentable that in many cases this lovely medium has been prostituted to the base motives of crime, greed and destruction.

—LYNETTE YOUNG.

BIRD OBSERVATIONS IN THE RIVERINA

Mr. Jas. Watson, country member at Albury, N.S.W., writes:

Since early September, 1952, I have been seeking birds in areas more distant from Albury than in previous years. The first of these was near Baldale, some 45 miles to the north-west, where Apostle-birds were found nesting, and a subsequent trip brought to light the Cockatiel (not nesting), the Stone Plover and Brolga. Both the last two have become exceedingly rare in the Riverina, where the sight of either is something of a novelty. There I visited a Kookaburra's nest with three eggs, while a White-faced Heron had a nest so scanty that the blue eggs could be seen through gaps in the sticks even from the ground. By the end of October, Brown Songlarks were very prominent in this section, whereas nearer Albury only the Rufous Songlarks were found. The latter almost certainly nested on the local Golf Links, right in the city here, but several early morning visits failed to find the nests in the waist-high grass.

On the October trip to Baldale I was informed that in a swamp a pair of Brolgas were probably nesting, so I called there on the way to keep an appointment. Judge my astonishment to discover not only Brolgas in the swamp, but, in the trees above, the finest nesting colony of White-necked Herons I have come across. A dozen nests were plainly visible from the road, and in the few minutes available—I was already late for that appointment—I noted a Yellow-billed Spoonbill, also on a nest, and with two babies shuffling about on the support, for all the world like animated powder-puffs. Next week I plan to look this area over again, for my friend says that he has several nests of the Azure Kingfisher (I think he means Rainbow-bird!) under observation, as well as a Songlark's nest.

The second area I have been watching is the Dora Dora State Forest, 37 miles north-east of Albury and about 6 miles from the Hume Highway as it approaches Holbrook. This is really good bush, nearly virgin, in the area I have covered. There is no other road or habitation to the south for about 25 miles, and it is a poor day when one sees no kangaroos or wallabies. My main interest there lay in the nesting of the Scarlet Robin, for several pairs were seen building, mostly well above 25 feet. Scrub-wrens with young were sighted, and both Grey and Pied Currawongs were present. During my October visit, a Noisy Friar-bird was finishing a bark nest 25 feet up, while the Gang-Gangs, in evidence earlier in the season, had probably gone further into the hills to breed, for they appear to prefer the very big timber.

—Communicated by H.C.E.S.

ORCHIDS AT CRESWICK

By J. H. WILLIS, National Herbarium, South Yarra

At the present time 45 species of *Orchidaceæ* have been noted (by competent observers) in the Creswick district, which lies on the northern slope of the Divide some 10 to 12 miles north of Ballarat (rainfall 27.7 inches). The majority of orchids favour gravelly ground in Stringybark-Peppermint woodland on the Ordovician formation, where *Xanthorrhoea minor* and *Leptospermum myrsinoides* are conspicuous. Often enough, such species as *Pterostylis longifolia* or *Diuris sulphurea* will be found growing consistently in the centre of *Xanthorrhoea* clumps, where an armature of tough rigid foliage protects the tender orchid parts from destruction by rabbits.

The following species are quite rare and are known from single Creswick collections: *Prasophyllum odoratum*, *Thelymitra flexuosa*, *T. innides*, *T. media*, *Acianthus veniformis*, *Lyperanthus suzucolens*, *Caladenia fletcheri*, *C. menziesii*, *C. cucullata*, *Pterostylis rufa*, *P. pusilla* and *P. cynocephala* (the last three discovered by R. W. Bond in 1933 and 1934). Others are restricted to a few small colonies and are certain to become rarer, e.g. *Calceana major*, *Prasophyllum juncum*, *Thelymitra grandiflora*, *T. austroriparia*, *Diuris longifolia*, *Corybas dilatatus*, *Caladenia clavata*, *C. deformis* and *Pterostylis barbata*.

Many good orchid grounds at Creswick have been ruined through the activities of the Forests Commission—replacement of bushland by pine plantations which effectively smother out any indigenous plants that are left. One cannot hope to halt development of areas set aside for the production of much-needed softwood, but it is lamentable that small patches of the best wildflower country could not have been reserved as part of the Commission's policy "Nature's Dell" at Lake St. George, as I first knew it, was one of the most beautiful spots about the township—a cool, fragrant, mossy retreat with banks of maidenhair fern along miniature cascades, the haunt of innumerable small birds (robins, tits, wrens, honey-eaters, fantails, pardalotes and whistlers); now it is a dark, depressing place, where all enchantment has been obliterated by a deep carpet of fallen needles and branch-litter from monotonous rows of pines.

Another danger to vanishing orchids are the local school children who heedlessly raid the areas where these charming flowers are still accessible, carrying off bunches to their homes or classrooms—they must be taught that a "bloom in the bush is worth two in the hand", and that theirs is the responsibility for protecting nature's wonderful heritage.

While rambling through the Creswick bush early in January, I was elated to see spire-like inflorescences of the onion orchid, *Microtis bipulvinaris* Nicholls, at several places near Lake St. George ("Government Dam")—in company with, but not nearly so frequent as, *M. unifolia*. This plant, previously known only from the type locality at Quail Island, Western Port (where I collected further material during November), appeared also in New South Wales at Woodford (Blue Mountains) last October. Since *M. bipulvinaris* is often associated in the field with typical *M. parviflora*, from which it appears to differ only in possessing large cushion-like swellings on the lower part of the labellum, one is inclined to the view that it may represent merely a peculiar development in *M. parviflora*.

Only three specimens of the fantastic Elbow Orchid (*Spiculaea huttoniana*) had been collected near Creswick before—each by a different person: but at the third small dam below Wolfe's, along the high southern bank of Slaty Creek, I saw literally hundreds of plants in flower! No insect visitors were observed, and time did not permit the keeping of an effective "watch". Later in January, Mr. Allan Sonsee found Elbow Orchids to be much more widespread in the Creswick district than we had imagined—he noted colonies on the summit of Humbug Hill, along Lincoln Gully, at the S.L. corner of Sawpit Plantation, and at Springmount.

NOTES ON AUSTRALIAN PTERIDOPHYTA

By N. A. WAKEFIELD

These notes are presented mainly as a supplement to a number of papers dealing with the taxonomy and nomenclature of the Victorian Fern-Flora, published in the *Victorian Naturalist* from June, 1942, to January, 1944. All the specimens cited hereunder were collected by the author in the County of Croajingolong, Victoria, and his herbarium specimen number is quoted in each case. This material is housed in the National Herbarium of Victoria (MEL.), except for some minor pieces which were donated to the National Herbarium of New South Wales (NSW).

1. Ref.—"A New Species of *Cyathea*", l.c. 59: 33 (June, 1942).

CYATHEA MARCESCENS N. A. Wakefield. The syntypes cited with the original description are here designated as

LECTOTYPE: Mt. Drummer, below "The Spring"; 2/2/1941, No. 96.

PARATYPE: Bungywar Creek, Combienbar; 2/8/1941; No. 95.

(No specimen was collected from the plants observed at Karlo Creek.) Excellent material of *C. marcescens* was collected recently from the type locality (Mt. Drummer); 12/1/1953; R. Melville No. 2821 & N.A.W.). This showed the indusium, which forms an irregular hemisphere round the lower half of the mature sorus, to consist of two sub-orbicular concave sub-entire scales each lateral to and on opposite sides of the nerve.

2. Ref.—"A New Species of *Schizaea*", l.c. 59: 89 (September, 1942).

SCHIZAEA ASPERULA N. A. Wakefield. Specimens were prepared from four of the localities cited, which syntypes are now set up as:

LECTOTYPE: Head of Betka River, on open heathland amongst *Xanthorrhoea*; 3/2/1941; No. 13. Part of this collection is the plant illustrated (on the left side) in *Vict. Nat.* 57: 66 (July 1940) erroneously as *S. bifida*.

PARATYPES: McKenzie River; 17/1/1941, No. 12; (Fragment, NSW, P.4828), Wingan River; 9/3/1941; No. 14. Newtons Creek, 17/1/1941; No. 15.

3. Ref.—"Some Victorian Species of *Blechnum*", l.c. 59: 193 (March 1943).

BLECHNUM NUDUM (Lab.) Mett. This combination, cited as new, had already been made by Mettinus (Lueres. *Flora* 1876, 292).

4. Ref.—"A New Species of *Hypolepis*", l.c. 60: 42 (July 1943).

HYPOLEPIS MUELLERI N. A. Wakefield.

HOLOTYPE: Mt. Drummer; 6/7/1941; No. 114.

5. Ref.—"Revision of the Victorian *Gleicheniaceae*", l.c. 60: 108 (November 1943).

STICHERUS LOBATUS N. A. Wakefield.

HOLOTYPE: Mt. Drummer, forming tangled masses in jungle on hill-sides; 6/7/1941, No. 31; (Fragment, NSW, P.6320).

A different collection (Bungywar Falls, Combienbar; 2/8/1941; No. 31) provided the material illustrated (l.c. 109), the details of which are:

1, a primary pinna ($\times\frac{1}{2}$); 1a, a typical pinnule ($\times 2$); 1b, paleae from the rachis (much enlarged); 1c, the cluster of lobed basal pinnules ($\times\frac{1}{2}$); 1d, a typical lobed pinnule ($\times\frac{1}{2}$).

[The error in citing *Sticherus flabellatus* (R. Br.) H. St. John as a new combination was indicated by J. H. Willis (l.c. 60: 196).]

6. Ref.—"Two New Species of *Tmesipteris*", l.c. 60: 142 (January 1944).

TMESIPTERIS OVATA N. A. Wakefield, l.c. 143.

HOLOTYPE: Mt. Drummer; 1/6/1941; No. 374; (Fragment, NSW. P.5811).

TMESIPTERIS PARVA N. A. Wakefield, l.c. 143.

HOLOTYPE: Karlo Creek (Mt. Drummer); 1/3/1941; (Fragment, NSW. P.5761).

The illustration of the two species was published upside down. Hence, as noted by J. H. Willis (l.c. 60: 196), each specific name refers respectively to a group of plants on the opposite side. The material for these illustrations came from the specimens

T. ovata—Mt. Drummer; 14/6/1941; No. 375.

T. parva—Mt. Drummer; 14/6/1941; No. 377.

Professor H. N. Barber of the University of Tasmania has made chromosome counts for several species of *Tmesipteris*, and he reports the following:

T. parva—Mt. Wilson, N.S.W.; Mt. Drummer, Vic.—102-104

T. billardieri Mt. Wilson; Mt. Drummer; Tasmania—102-104.

T. truncata—Sydney District, N.S.W.—204-214.

T. ovata—MacPherson Ra, Qld.; Mt. Drummer—about 200.

7. Ref.—"New Combinations in Some Australian Ferns", l.c. 66: 39 (July 1949).

CYATHEA WOOLSIANA (F. Muell.) Domin. This species was wrongly included, for the combination had already been validly published by Domin: *Pteridophyta* (1929) 263.

MORE WINTER SHRUBS AND ATTRACTIVE WILDFLOWERS

There are a few additions that I would like to make to the list of "Victorian Wildflowers" which provide outstanding displays (*Vict. Nat.*, December, 1952). The first of these are the Tall Sun-orchid (*Thelymitra media*) and the Great Sun-orchid (*T. grandiflora*), both of which may grow to a height of about thirty inches. Recently, I counted twenty-six individual flowers on a Tall Sun-orchid, and one can imagine nothing more beautiful than its attractive colouring and stately dignity.

Some of our other blue wildflowers which are worth special comment because of their massed displays during spring and early summer are Bluebells (*Wahlenbergia gracilis*), Pincushions (*Brunonia australis*), and Blue Dampiera (*D. stricta*).

A further list of native plants which flower during the winter months may be of interest. (See "Winter Flowering Shrubs", *Vict. Nat.*, 69: 3—July, 1952.)

To the list of those which flower throughout the winter may be added several species of *Correa* including *pulchella* with its salmon bells, a hybrid *Correa* with all-red flowers, and various forms of *Correa rubra*; while the Dotted Heath-myrtle (*Thyptomena saxicola*) and Fuchsia Heath (*Epacris longiflora*) flower at intervals throughout the year. Rock Isotome (*I. axillaris*) flowers continuously but is best treated as an annual.

Other native plants which helped to brighten our garden during the winter months included the Red-flowered Tea-tree (*Leptospermum scoparium lambethii*), Showy Bauera (*B. sessiliflora*), Golden Grevillea (*G. chrysophaeo*), and Common Hovea (*H. heterophylla*).

Although *Hakea laurina* was one of the few native plants to welcome winter with a show of bloom, there were many which flowered late in that season and greeted spring with a floral display. These included Wiry Bauera (*B. rubioides*), a purple Coral Pea (*Hardenbergia comptoniana*), Indigo (*Indigofera australis*), Entaxia (*E. microphylla*), Spike Wattle (*Acacia oxycedrus*), Varnish Wattle (*Acacia verniciflua*), and the Darling Pea (*Swainsona procumbens*).

—A. E. BROOKS.

MOUNTAIN MINIATURES, No. 2

By H. C. E. STEWART, Melbourne

Mr. W. G. Chandler, Forestry Officer of the State Electricity Commission of Victoria, has compiled a chart of "Eucalypts occurring in the Wangaratta-Bright-Bogong Area." Twenty-four species are tabulated to accord with the arrangement serials of W. F. Blakely's *Key to the Eucalypts*, and, besides line sketches of the buds and fruits, clues are given for identification and location. A copy of the chart is available at the Mount Buffalo Chalet, and, with the Buffalo species, visitors are afforded a helpful service, dispelling much of the confusion that prevails with the eucalypts there, as elsewhere. For instance, Mr. Chandler records the occurrence of Candlebarks (*E. rubida*) around the Chalet. The non-expert experiences difficulty in the field separating the Candlebark from its close ally, the variable Broad-leaved Kindlingbark (*E. dalrympleana*), the predominant tree in the vicinity. The chart enumerates clearly the morphological differences.

During a week spent on the mountain late in January 1952, visitors remarked on the peerless beauty of the Candlebarks seen along the road up the Mount continuously from about four-mile to above fifteen-mile. I have never known these trees to present so striking a contrast with the new bark in white and pale chrome colourings against the vivid green foliage. The old bark had decorticated evenly in long strips, imparting to the tall slender trunks the apt vernacular of Candlebarks. Freedom from fire since 1939, and a sudden spell of warm weather following a late winter season of snow and frosts, were possibly two factors impelling the new bark to show up clearly and uniformly. Similar influences, too, seem to have been at work on the boles of the few magnificent White Brittle Gums (*E. maculosa*) around Mackay's Lookout, at twelve-mile. In these the old bark, except on the lower trunks, had come off in flakes, giving mottled effects in delicate tones of grey and white. Curiously, the few lofty Candlebarks on the granite at Beud's Lookout, 4,500 feet, showed the burnished brick-red holes and main branches, typical of *rubida*.

Of the two Peppermints common in the locality, Mr. Chandler cites the Broad-leaved Peppermint (*E. dives*), as found up to the eleven-mile peg on the main road, an elevation of just under 3,000 feet. This Peppermint possesses compact fibrous bark on the stem and well out on the main branches, features referred to in Blakely's *Key*. On a previous visit, just two years ago, Mr. Frank Hobson, then park ranger, directed my attention to two mature examples of Peppermint, since verified as *E. dives*. One, at the side of the road about eighteen-mile, directly below the north-east section of the Chalet, is marked with the elevation sign of 4,500 feet. The other stands a few yards away and nearer to the edge of the Gorge. Further smaller specimens are dotted sparsely along the tracks ending to Reed's and Manfield's Lookouts. Thus *E. dives* occasionally advances its normal range to well above the snow line, a tendency noted in other high alpine situations.

An interesting rediscovery made on the Plateau early in January 1950 was *Logania floribunda*. The ringing call of a Pilot bird, followed by a momentary glimpse of it disappearing into the undergrowth, caused me to peer into the bushes, when a plant bearing fruit was seen. A day or so later another bush, in flower, was found by Mr. E. R. Lord, on the exactly opposite side of the track where it merges into the inner Gorge, overlooking the Crystal Brook Falls. The spot is a short distance from the camp site of the first official excursion of Club members in December, 1903. The species was not recorded then, nor can any printed mention be ascertained since. Check at the National Herbarium, Melbourne, discloses that Baron von Mueller found the species on his visit to the Buffalo in 1853! Further occurrences of the plant have since been noted lower down at Mackay's Lookout, 3,100 feet.

ALFRED PARK**An East Gippsland National Reserve**

By N. A. WAKEFIELD.

Just over three hundred miles east of Melbourne, the Princes Highway runs through one of Victoria's finest National Parks. But few who pass there know it as such. Some see the sign, "MT. DRUMMER, 1,184 FEET", they note the tropical aspect of the vegetation, and perhaps pause to take in the rather fine panoramas away to the south and the east. But most motorists concentrate on the winding road with its numerous blind bends, and no doubt regard the mountain as just another delay as they hasten on for more civilized parts.

May we, then, introduce this delightful little spot to the traveller, with the suggestion that he at least stops at the Spring to drink in the delicious mountain air with its aroma of musk and blanket-leaf; or maybe to boil the billy at the fireplace there, and feel the peace and serenity of the place as he partakes of his lunch?

The first chapter in the story of Mount Drummer is almost lost in the obscurity of the past. A hundred years ago, the original dray-track from Genoa to Cann River crossed the spur some miles to the north of the present highway. In those days there were a few cattle runs in the Genoa district, and the Cann Valley was used as an auxiliary to one of them. One day, as a team was labouring across the range, one of the bullocks—named "The Drummer"—put its head on the wrong side of a small tree. Its neck was broken, but in losing its life, the victim attained immortality, for the scene of the accident was known thereafter as "The Drummer's Mountain".

About thirty years ago, the Cann-Genoa section of the Princes Highway was opened, and from then until the present day, motorists have passed through the pocket of jungle which is now part of the National Park.

It was not long before official notice was taken of this stray patch of subtropical rain-forest; for in 1924, the Field Naturalists Club of Victoria made representation to the Lands Department, with the result that, by 1926, a 5,400-acre tract about Mount Drummer was surveyed and reserved. The Minister for Lands at that time was the Hon. Alfred Downward, M.L.A., and his christian name provided the title for the new National Park.

Those who pause on the road to look down across the main jungle hollow, are at once impressed by the remarkable difference between the two types of forest. The general vegetation of the district is a dense growth of Eucalyptus of a dozen different

PLATE III



Photo: N. A. Wakefield.

Lilly-Pilly and Liana in the Alfred National Park.



Massive Water-Vine supporting Jungle Polypody and Lilly-Pilly tree with Creeping Wood fern at its base.



Photos: N. A. Wakefield.
Skirted Treefern at Mount Drummer.

species, with many wattles and other shrubs, as well as a medley of smaller herbage. But here this country gives place, in a few yards, across an amazingly clear-cut line of demarkation, to a massed tangle of creepers, shrubs and trees of an entirely different set.

One can be in the open forest one moment, confronting the jungle wall, and then push through this curtain into a world apart. The change is startling in its suddenness—the foliage is now many feet overhead, shutting out all direct sunlight, and one is knee-deep in massed ferns, with pillared tree-trunks and festoons of "monkey-ropes" in between.

Before those devastating bush fires of early 1939, there was, up the mountain-side above the road, a spectacular wall of trees and creepers, with the crimson flame of waratahs each spring-time. Most of this was destroyed, and is now replaced by a dense growth, mainly Blanket-leaf, pretty enough in its way, but nothing like the glory that was.

Beneath a road culvert flows the "Spring"—a mere trickle of water, but never dry; and nearby, Country Roads Board employees have constructed a substantial fireplace. A few yards away is the habitat of the Violet Nightshade, which has not been found elsewhere in Victoria.

Below the edge of the highway, there is an almost impenetrable barrier of secondary growth, the appearance of which is sufficient to damp the ardour of any but the most enthusiastic explorer. Tree-ferns, "Musk" and "Hazel" form a bulwark for various creepers as well as the native Molucca Bramble, and, unfortunately, quite an amount of the introduced Blackberry, too. But there is no need to be daunted, for once a path is negotiated through this few feet of scrub, the going is quite easy, and one may spend a very pleasant hour or so exploring this remarkable underworld of fern and creeper.

All the eucalypts have remained behind in the open forest, to be replaced here by large Blackwood and Lilly-Pilly trees. To these the massive Water Vine clings, trailing its thick stems as though tied in knots by some giant hand. Musk Daisy-bush and Blanket-leaf are the main tree-shrubs, competing for place with hundreds of fronded pillars of the Rough Tree-fern. With all this foliage away overhead, one walks through masses of ground ferns. The Creeping Wood-fern is the most plentiful, growing literally by acres; and yet this spot is its furthest penetration into Victoria!

Further down is the attractive Bolwarra with its large shining neatly arrayed leaves, and scores of Prickly Tree-ferns whose fronds will tear a person's clothes—just as blackberries do. On

the trunks of the Tree-ferns are clumps of the delicate little Jungle Bristle-fern and two diminutive species of Fern-Clubmoss, all of which are botanical rarities, at least as far as Victoria is concerned.

Now and again, often where a great tree has fallen to drag a gap in the ceiling of foliage, a patch of sunlight strikes through. Then the ground ferns harden and adopt a yellowish hue, and other species appear. There may be the tiered fronds of the Spreading Fan-fern, or the oak-like Bat's-wing Fern; and masses of Stalked Doubah climb in a riot over everything.

Along the creek fed by the spring, at the bottom of the gully, grow the giant Kanooka trees, their enormous buttressed trunks clothed with Filmy Ferns and mosses, and the vast spreading limbs massed with Kangaroo Fern and curtained with the beautiful Weeping Spleenwort. One of these massive trees supports no fewer than four of the large jungle lianas—Water Vine, Doubah, Morinda and Big-leaf Vine, their foliage lost to sight a hundred feet overhead.

Here the Soft Tree-fern predominates, its bowl a perch for innumerable epiphytic ferns and the soft-leaved Fieldia. But there are also its two rare cousins, the Slender Tree-fern and the Skirted Tree-fern. The latter was unknown to science until it was discovered at Mount Drummer in 1940, and has never been found outside Victoria. A huge plant with a crown usually well over thirty feet across, this Skirted Tree-fern grows in a few Gippsland gullies, and has been located, too, in the Otway Ranges.

In the wet gully bottom the Gippsland Waratah grows to perfection, often to a height of thirty or forty feet. In fact, one which had fallen proved to have been 62 feet in height, and the trunk was over a foot thick. Hundreds of great blood-red blossoms and the large attractive leaves make it one of Australia's show-pieces.

And so one may wander about in this wonderland of plants to his heart's content. No great distance is covered, for progress is very slow, not through difficulty, but simply because of the endless succession of nooks and corners to be explored, and beauties and wonders to be investigated.

Every now and again a vehicle hums past along the road a hundred yards or so above, but otherwise there is an eerie feeling of unreality. Perhaps what creates the impression is the semi-darkness of the place and those huge fantastically twisted monkey-zopes.

Back up on the road once again, in the bright sunlight, walking along to where the car is waiting, one carries for a while a vague feeling, difficult to define—a peculiar subdued sensation of the magnitude of Nature's handiwork, and the riot of sizes and shapes down there in the gloomy seclusion of the jungle.

Summary of Plants mentioned:

Common Filmy-Fern	<i>Hymenophyllum cupressiforme</i>
Jungle Bristle-Fern	<i>Macrozamia caudata</i>
Rough Treefern	<i>Cyathea australis</i>
Prickly Treefern	<i>Cyathea leichhardtiana</i>
Skirted Treefern	<i>Cyathea marcescens</i>
Soft Treefern	<i>Dicksonia antarctica</i>
Spreading Fan-Fern	<i>Sticherus lobatus</i>
Creeping Wood-Fern	<i>Dryopteris tenera</i>
Weeping Spleenwort	<i>Asplenium flaccidum</i>
Jungle Polypody	<i>Polypodium pustulatum</i>
Kangaroo Fern	<i>Polypodium diversifolium</i>
Tiny Fern-Clubmoss	<i>Timosipteris parva</i>
Blunt Fern-Clubmoss	<i>Timosipteris ovata</i>
Gippsland Waratah	<i>Telopea oreades</i>
Big-leaf Vine	<i>Sarcopetalum harveyanum</i>
Molucca Bramble	<i>Rubus hillii</i>
Blackwood	<i>Acacia melanoxylon</i>
Bolwarra	<i>Eupomatia laurina</i>
Water Vine	<i>Cissus hypoglauca</i>
Lilly-Pilly	<i>Acmacna smithii</i>
Kanooka	<i>Tristania laurina</i>
Stalked Doublah	<i>Marsdenia rostrata</i>
Fieldia	<i>Fieldia australis</i>
Violet Nightshade	<i>Solanum violaceum</i>
Jasmin Morinda	<i>Morinda jasminoides</i>
Musk Daisy-bush	<i>Olearia argophylla</i>
Blanket-leaf	<i>Bedfordia salicina</i>

*These species, and also *Hypolepis muelleri*, constitute a group of five recently described Pteridophytes whose type specimens came from the Alfred National Park.

NATURALISTS' NOTE-BOOK

(Space will be available here each month for you to record your observations, notes and queries in connection with aspects of Natural History. Share your opinions with others and make the "Note-Book" a source of interest.—Editor)

KRAKATOA

It is reported that this island is again in eruption (1952). In the eruption of 1883 "this forest-clad island was converted into a lifeless desert of laval ashes varying from 90 to 200 feet in thickness. Not a vestige of soil could be traced on the island. Very soon blue-green algae covered the barren waste and began to prepare the way for lichens and suchlike plants of simple type; then mosses appeared. Three years later a few ferns established themselves, to be followed soon by more ferns and plants of larger growth. In fifty years a new soil had been developed and the island reclothed with forest."—from *Continuous Creation*, by Wilfred Brankfield, with introduction by Professor Frederic Wood-Jones.

—L.Y

THE LARK'S NEST

"The meadow had remained empty since the previous summer, even the grass in the gateway leading to the next field showed no sign of having been disturbed. Thirty feet from the gateway a pair of larks were nesting, and I was dismayed to see a herd of cows walk across the field to the gateway, lurch through it and stride towards the hidden nest. Just as I expected to see the two leading cows, still in close column, trample over the nest, a lark rose in the air, its wings almost brushing the muzzle

of one cow. In their surprise, the leaders swung to left and right, and their followers, too, went round and not over the nest. I did not see the cattle return that afternoon, but next morning, after milking, the same thing happened: the lark flew up and diverted the cows. In a few days they had worn paths that curved outwards beyond the gate, leaving a shield of untrampled grass where the nest was hidden."—RUSSEL BARR, Somerset. From *The Countryman*, Summer, 1951.

—J. W. RAFF

MOUNT ELIZA IN SUMMERTIME

It was, in truth, the last day of February and thus of summer when last I visited Mount Eliza. It seemed to me interesting to find what this area, so rich in flowers during the more favourable seasons, had to offer in the late summertime.

Hyacinth Orchids were the main attraction, many of them at the peak of perfection and adding bright touches of colour among the more sombre undergrowth. There were pink and white spikes of Common Heath on the hillsides, but whether these were very early or very late I was quite unable to say. Wiry Buttons, Bluebells (*Wahlenbergia confinis*), and Austral Centaury added other touches of colour, and the silvery grey of juvenile eucalypt leaves provided still more variety.

The panoramic views were as wonderful as ever. In different directions Port Phillip and Westernport Bays, and places as far distant as the You Yangs and the Strzelecki Ranges, the blue Dandenongs, French Island and Arthur's Seat presented colourful pictures framed by eucalypts of varied greens.

I saw no black wallaby as I had on other occasions, but although the crest of the range lacked its June display of Common Heath, the November Sun-orchids and its glorious springtime show, it was still well worth a visit during this off-season.—A.E.B.

AUSTRALIAN SHRUBS NEEDED FOR WATTLE PARK

Bauera sessiliflora, *Beaufortia sparsa*, *Callistemon speciosus*, *Callistemon citrinus* (lanceolatus), *Calothamnus villosus*, *Cratalaria*, *Eriostemon myoporoides*, *Grevillea lavandulacea*, *Grevillea linearis*, *Grevillea hookeriana*, *Grevillea oleoides* dimorpha, *Hibiscus huegelii*, *Kunzea sericea*, *Leptospermum "lambethii"*, *Leptospermum scoparium grandiflorum*, *Melaleuca steedmanii* and *Prastanthera ovalifolium*—1 each.

Correa reflexa rubra, *Epacris longiflora*, *Crowea saligna* (*Eriostemon crowei*), *Hovea elliptica*, *Micromyrtus*, *Prastanthera rotundifolia rosca* and *Swainsona galegifolia* red—several each.

E. E. LOAN

WHAT, WHERE AND WHEN

General Excursions:

Sunday, May 17—Menzies Creek Subject: Fungi. Leaders: Botany Group. Take 8.45 Upper Ferntree Gully train, then Clematis bus to Menzies Creek. Bring one meal.

Saturday, May 23—Sydenham Wildflower Sanctuary weeding day. Take 9.35 St. Alban's train from Flinders Street, then by private cars. Bring one meal.

Saturday, June 6—Botanic Gardens. Subject: Winter Vistas. Leader: H. Stewart. Meet at William Tell rest house by 2.30 p.m.

Group Fixtures:

Tuesday, June 2—Geology Discussion Group. Meet at Russell Street entrance of National Museum, 7.30 p.m.

(Botany Group in recess during renovations of Royal Society's Hall.)

KENNEVY ATKINS, Excursions Secretary,

The Victorian Naturalist

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No. 834

PROCEEDINGS

The General Meeting at the National Herbarium was held on May 11, with Dr. Chattaway presiding and over one hundred members and visitors in attendance. Seven new members were elected: Messrs. Wallace and Thurbon as Ordinary Members, Mr. and Mrs. Thomas as Joint Members, Mr. Lincoln and Miss Brady as Country Members, and Miss Bowker as Junior Country Member.

Dr. Chattaway then delivered the Presidential Address, which took the form of a well illustrated discourse on the structure of eucalyptus bark. This demonstrated the research upon which Dr. Chattaway has been engaged during the past two years for the Forest Products Division of the C.S.I.R.O. The general ground covered in the address may be read elsewhere in this issue. Many members asked questions, and Mr. Willis and Mr. Baker proposed a vote of thanks on behalf of the Club.

A letter was read from the Victorian Photographic Society, inviting members to attend Miss Ina Watson's colour films on Central Australia, at the Radio School on Friday, June 15.

It was reported that Club mail had been interfered with at the Royal Society's Hall, so all mail should henceforth be sent direct to office-bearers, and any case of suspected theft of mailed subscriptions should be reported.

Correspondence was read from Mr. Lord making a further appeal for plants, or donations to purchase them, for Wattle Park. Those needed were listed in the May *Naturalist*.

Best wishes were extended to Mrs. Fisch and her daughter Anne, who are to visit Switzerland shortly.

The meeting adjourned at about 9.30 p.m. for the *Conversazione* and examination of exhibits.

NOMINATIONS FOR OFFICE-BEARERS

President	Mr. A. A. Baker
Vice-Presidents	Professor Turner, Mr. Sarovitch
Secretary	Mr. F. Lewis
Assistant Secretary	Miss L. Kurth
Treasurer	Dr. W. Gericke
Assistant Treasurer	Miss N. Fletcher
Editor	Mr N. A. Wakefield
Assistant Editor	Mr. A. E. Brooks
Librarian	Mr. A. Burke
Assistant Librarian	Mr. R. Lee
Excursion Secretary	Mr. K. Atkins
Council	Messrs. A. W. Burston, P. Fisch, R. B. Jennison, E. F. Lord.

EXHIBITS AND NATURE NOTES AT MAY MEETING

Botany

Rare plants from eastern Victoria—Mr. H. Stewart. *Schoenus imberbis*, a rare Hog Rush, and *Besnoia heterophylla*, a brilliant autumn flowering legume, both came from Sporn Whale Head. *Philydrium lanuginosum*, the "Woolly Water-lily", which has been collected but few times in Victoria, and *Eriogonum scariosum* ("Pipewort"), a small marsh plant, were both from the same paddock along the Princes Highway near Fernbank. The latter two show remarkable net-like septate structure in the inner leaves. An uncommon Conebush, *Isopogon anemonifolius*, was collected at the 150-mile post along the railway line near Fernbank.

Acorns of the Portuguese or Pin Oak—Mr. G. Coghill. This species was planted some years ago, at Mr. Coghill's instigation, along Monomeith Avenue in Camberwell, which street is now said to be one of the showiest in the world.

Orchids grown in pots—Mr. W. Williams. One of these, *Pterostylis truncata*, was in full bloom after a remarkably short period of ten days from when the shoot first appeared above the ground.

Water-bearing root of Mallee (*Eucalyptus grandis*) from near Iron Knob, South Australia—Mr. E. Hanks. About threequarters of a cup of good clear water was obtained from this, dripping slowly out over about 20 minutes.

Geology

Quartz crystals replacing wood structure, in brown coal from Altona, Victoria—Messrs. A. Baker and D. Jeffrey. These crystals were formed from siliceous solutions from the surface, penetrating through the sands above the brown coal bed and saturating the wood. Precipitation of the silica from the solutions gave rise to the crystals, as their growth removed portions of the woody matter. The layers across two of the specimens were infilling transverse cracks in the wood, caused while the wood was being converted into lignite (brown coal). The quartz crystals are mostly double-pointed; that is, they have a pyramid formed at each end. The specimen sparkled when moved in direct light, and the crystals could be seen under the microscope.

GEOLOGY GROUP

The May meeting was held at the National Museum, 22 members and visitors being present.

Report.—Mr. J. A. Blackburn gave an account of a Group excursion to The Boulevard, Essendon, where marine fossils were collected and the Older Basalt observed.

Address.—As illness prevented the speaker for the evening from attending, a talk on Bonco Swamp (near Rosebud, on the Nepean Peninsula) was given by Mr. E. D. Gill. New Zealanders studying the famous moa swamp at Pyramid Valley in the South Island requested material from Bonco Swamp for the purpose of examining more closely the ostracod *Limnocythere sicula*. Mr. Gill therefore visited the swamp and by an auger hole on Brown's Road proved the presence there of two formations, viz.:

1. An upper black carbonaceous alluvium with numerous fossil snails, ostracods (*Limnocythere*), and some diatoms (*Synedra*).

2. A lower yellowish non-carbonaceous highly calcareous sand with microfossils, including diatoms (*Synedra*, *Epithemia*). Mr. N. B. Tindale has studied the diatom flora from these beds.

Keble has reported marine beds from localities nearer the coast, which proves an incursion of the sea in not very distant times, and the overlying alluvium has developed since then.

Exhibit.—Gold in quartz vein from Daylesford (polished section), by Mr. D. Jeffrey.

A. A. BAKER.

A MYSTERY TREE

By CHAS. WEIR, J.P., Blackburn.

It is just a Yellow Box tree standing amongst other stunted trees in sheep country, but to the few who know it well it is a source of wonder.



Probably about the year 1855 it was chopped down, leaving only a stump about four feet high with a hollow centre. However, the tree did not die, but sent out a sprout which developed into a strong sapling which gradually spread around the stump and grew into a fair-sized tree.

It was first pointed out to me by an old schoolmate over forty years ago. He told me that when a boy he had noticed the attraction the tree apparently held for birds and insects, and on inspection found that the hollow in the old stump inside the tree was always full of water, even in the hottest and driest of summers. I put my hand into the hollow, and the water was there. In the intervening years I have visited the tree again and again and have always had the same experience. It has therefore been under observation for over sixty years.



Where does the water come from, and how does it collect inside the hollow? There is no water nearby; the tree is growing in shallow gravelly soil, with a hard reef a few feet below the surface. The upper picture shows the tree as it is today. In the "close-up" the aperture is shown; part of the old dead stump can be clearly seen, and the hollow was, as always, full of water.

I would like some naturalist to inspect this tree with the object of solving its mystery. It would make a pleasant day's outing, about twenty miles beyond Ballarat, passing through a district of much interest to geologists and naturalists generally.

(Since the above was written, the Ballarat F.N.C. has been interested in the "Mystery Tree", and one of our Melbourne Club members has decided to make the trip to inspect it.—Editor.)

CORRECTION

Ref.—NOTES ON AUSTRALIAN PTERIDOPHYTES (*Vict. Nat.*, 70: 9)

The specimen referred to as of *Cyathea marcescens* (R. Melville No. 2821 & N.A.W.) was in fact of the somewhat similar *C. cunninghamii*. Hence the description of the indusium set out there does not apply to that of the former species.

N. A. WAKEFIELD.

MYCOLOGICAL EXCURSION TO SHERBROOKE FOREST

By J. H. WILLIS

The last report of a Club outing devoted to fungi appeared in the *Naturalist* of July 1948 (65: 69). Beenak had been the venue then (April 10); but as that excursion came at the end of a protracted dry spell, there was little to reward our long trip.

On May 2nd this year a party of two dozen members was apprehensive of similar disappointment at Sherbrooke Forest where no substantial rain had fallen for many weeks. However, Sherbrooke's perpetually damp ferny dells yielded 60 species of the 240 higher kinds known from that area.

Excursionists entered the forest by Ferny Creek memorial gates, and the first specimen collected was *Mycena cipterygia*—a grey-capped, yellow-stemmed midget with odour suggesting cucumber. En route to the "falls", we seen found five other toadstools in this attractive genus, the more colourful being blood-red *M. viscido-cruenta* and peerless *M. interrupta* ("Pyxies' Parasol") of delicate blue—the former on fallen twigs and leaves, the latter on moist logs. Commonest gilled-fungus was the little white *Lepiota parvannulata*, and russet *Laccaria laccata* was almost as numerous. Not infrequent were two species each of *Russula* and *Hypholoma*, viz., *R. lepida* (white form); *R. cyanoxantha*, *H. fasciculare* and *H. sublateritium*. The last species, in immature clumps against logs and stumps, was highly decorative—dense clusters of dark brick-red buttons, flecked with white and surmounting very shaggy whitish stems. A few isolated individuals of the burnished violet *Cortinarius subarcheri* occasionally brightened the humus, but its many vivid congeners were absent.

Except for a few indeterminate *Hymenogasteraceae*, no member of the intriguing puffball assemblage could be found. Coral fungi (*Clavaria* spp.) were also scarce, the only two observed being *C. cristata*—in several forms, from very crested and almost white to thick, rugulose, unbranched and dark greyish—and the peppery, wood-inhabiting *C. pyxidata*. One magnificent blue-green colony of the verdigris "cup fungus", *Chlorosplenium aeruginosum*, became an object of admiration on rotting branchwood; the broken timber showed well the extent of invasion by its equally vivid, concolorous mycelium.

After enjoying lunch in perfect sunny weather at the falls picnic ground, we followed a scenic contour through pine plantations on the way down to Terry's Hill, Belgrave. The pines yielded a surprising harvest of that large, introduced orange-zoned and edible *Lactarius deliciosus*, which was gathered enthusiastically by several for gastronomic purposes (*but*, it needs to be fried in oil or fat, never stewed!). An interesting experience was to stroll through a stand of closely planted Douglas Fir, stepping from bright sunlight into a stygian gloom that was almost eerie—not a green plant or even fungus relieved the sombre carpet of fallen needles.

Throughout the afternoon special attention was given to wood-destroying types (*Stereum*, *Fomes*, *Polyporus*, *Poria*, *Trametes*, *Coriolus*, etc.), and Mr. Neville Walters, mycologist from the C.S.I.R.O. Forest Products Division, secured a good "bag" for subsequent examination; he appealed for assistance in collecting these pathogens and distributed leaflets among members, with instructions on how to gather and annotate their specimens [see illustrated article, "Wood-destroying Fungi" by Mr. Walters in the May number of *Wild Life and Outdoors*, pp. 423-430].

One very big, lethargic crane-fly was bottled—a handsome white-spotted insect of black and orange-brown (probably *Scenotes* sp.)—but animal life on the whole chose deliscescence. Very few bird notes enlivened the air, and lyrebirds were almost silent; a stray kookaburra, crimson rosella ("red lory") and yellow robins came to watch us at lunch, while from nearby scrub we heard the shrill calls of a pilot-bird.

PLATE V



Dr. Margaret M. Chattaway—F.N.C. President, 1952-53

THE STRUCTURE OF EUCALYPT BARK

(Substance of Presidential Address to the Club—May 11, 1953)

By MARGARET CHATTAWAY

In the course of an investigation of the bark of various eucalypt species, it became clear that although from the days of Baron von Mueller the genus *Eucalyptus* has been classified according to the appearance of the bark, very little anatomical work had been done on bark generally, and practically none on that of the genus *Eucalyptus*, and it was therefore considered that some information on the subject would be of general interest.

A few botanical terms must be used; they are defined below:

Epidermis—the outermost protective layer of the young stem.

Cortex—the outer layers of the young stem, forming the tissue between the phloem and the epidermis.

Phloem—the product of cambial division towards the periphery of the tree, considered as conducting the manufactured foodstuffs from the crown of leaves.

Cuticle—the waterproof outer layer of the epidermis.

Periderm—the layers of cells which replace the epidermis in old stems; it consists of the *phellogen* or cork cambium, an actively dividing layer which cuts off layers of *phelloderm* on the inside and layers of *phellem* on the outside of the stem.

Rhytidome—dead tissue which has been cut off by the periderm.

Suberin—an impermeable substance which may be deposited within the wall structure of the cells, or secreted and accumulated as a covering layer outside them.

As the term "bark", which was originally applied only to the dead tissue covering the stem, is loosely used in the non-technical sense of "everything outside the cambium", the technical term "rhytidome" is preferred and will be used for the dead tissue which has been cut off by the periderm.

The structural differences between xylem (wood) and phloem are due not only to the different functions the tissues fulfil, but also to their different positions in relation to cambial growth and the increase in girth of the stem. In an actively growing tree the cambium has a twofold function to perform. It not only contributes to the girth of the tree through tangential divisions which add new cells to the xylem and phloem respectively, but it also accommodates itself, and consequently the tissue it produces, to the increasing girth. As this increase is on the outside of the xylem, the tissue undergoes little extension after it has been formed, and secondary thickening of the cell walls soon fixes it into a mould that does not alter much throughout its life. Except for the formation of tyloses at the inner edge of the sapwood, the cell pattern of the wood is fixed within a few millimetres of the cambial layer, and no further growth of the wood cells occurs.

Such is not the case in the phloem. The cambial divisions, which are sufficient to keep pace with the increasing perimeter on the inner edge of the phloem, cannot have any effect at the point of greatest increase, which is in the oldest layers of the phloem, on the outside of the stem, at the farthest point from the actively growing cambium. The phloem is, therefore, under a constant tangential strain all its life. The cells of the parenchyma and rays in the phloem remain alive and can undergo division and enlargement until they are finally isolated by the formation of a periderm which cuts them off from the food supply and causes their death and the subsequent formation of rhytidome.

The structure of the young stem is very uniform throughout the eucalypts, the characteristic features of the mature trees developing when the stem is four or five years old, or, in some species, the juvenile bark structure being retained throughout the life of the tree, except for a portion of variable height at the base of the tree.

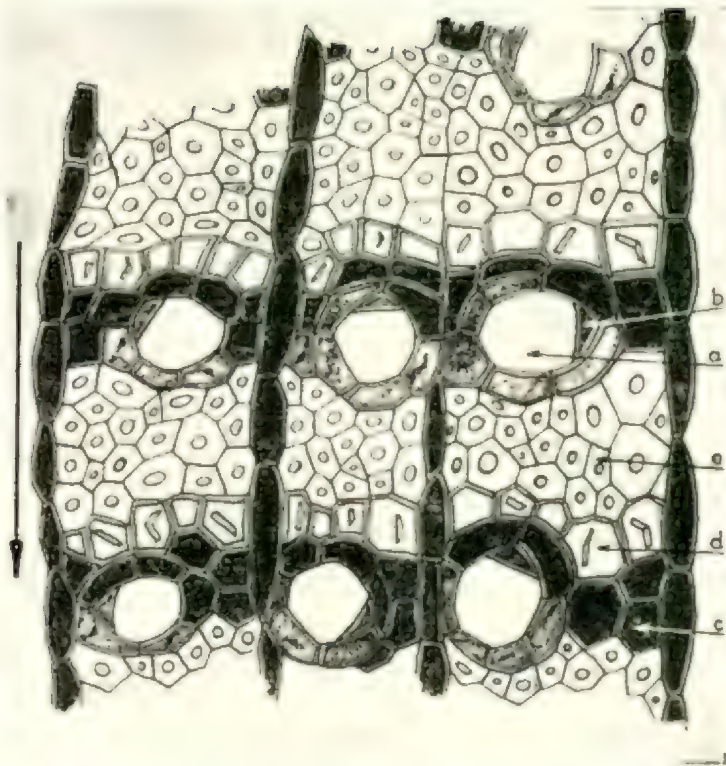


Fig. 1.—Cross-section of phloem of *Eucalyptus obliqua* L'Herit ($\times 350$). The arrow on the left points towards the cambium.

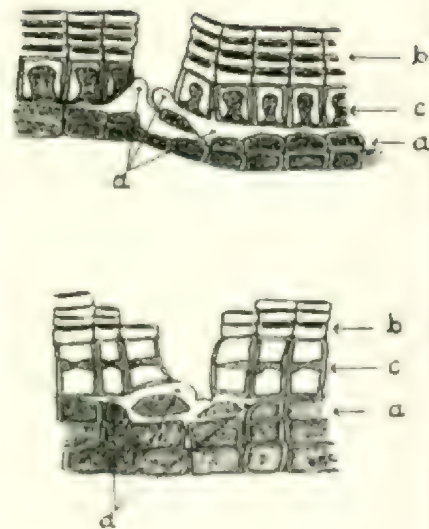


Fig. 3.—Suberin deposits sealing cracks in the phellum of *E. australiana* Bak. and Smith and *E. regnans* F.v.M. ($\times 350$).

The young phloem (Fig. 1) is a very regular tissue consisting of sieve tubes (a) and their companion cells (b), tanniferous (c) and crystalliferous (d) parenchyma, and bands or patches of fibres (e). The cortex consists of tanniferous parenchyma and contains a variable number of oil glands towards the periphery. The epidermis, covered outside with a thick layer of cuticle, at first keeps pace with the expanding girth of the stem, the epidermal cells dividing by radial walls and the cuticle continuing to define the limits of the original cells (Fig. 2).

As soon as the epidermal layer is stretched to its uttermost, the first periderm forms, immediately underneath it, usually beginning under the lenticels. This periderm is the pattern for all the subsequent ones and consists of a phellogen (Fig. 3a) which produces a variable number of layers of thick-walled lignified cells with all the thickening on the inner tangential wall (b) interspersed with a variable number of suberised layers, the cells of which are, at first, thin-walled, but which later acquire an inner lignified layer which may fill most of the cell (c). As the strain of growth becomes greater this layer ruptures, but the break is quickly made good by the secretion of suberin by the outer cortical layer (d). These deposits may be so great that they give the appearance in cross sections of a new epidermis, where the broken periderm has fallen away. The suberin seal is not sufficient as a permanent outer covering and new periderms form deeper and deeper into the cortex till the whole cortex has been cut off and the periderms form in the phloem itself. It is at this stage that the different types of rhytidome associated with the various groups of eucalypts begin to develop.

In the gums, which have smooth white or greyish trunks, the rhytidome is shed in the later summer and early autumn, leaving the stem always in the juvenile state, covered by only one periderm which is kept impermeable as the year goes on, by the development of suberin deposits under the newly formed cracks.

The stringybarks, which are covered by a very thick loose bark which is never shed, but only worn away gradually by abrasion, have a phelloderm five to six cells wide inside the phellogen. The phellum is in its early stages very similar to that of the gums. The characteristic of these trees is the enlargement of the phloem parenchyma which takes place as each new periderm forms, causing the tissue between the new and old periderms to become very loose and spongy. At the same time a tangential band of radially elongated cells forms in the phelloderm. These cells may enlarge to many times their original size; they are usually thin-walled, but adhere strongly together so that they are a conspicuous feature of the torn and dry rhytidome on the very outside of the old tree. They can be seen with the naked eye as light tangential bands on cross surfaces of the bark.

In the boxes and peppermints the young stems still have the characteristic structure noted above. In older trees, however, the bark becomes rugose, that is to say, wrinkled, and is persistent on the whole tree except the young branches. The rhytidome is formed by the development of a number of closely spaced periderms which may be many cells wide and are usually without conspicuous thickenings on any of the cells. When the stem expands with the growth of the tree the stretching causes the phloem and ray parenchyma to expand, and the living cells divide so that the mature bark consists of alternating wedges of phloem and parenchyma. The phloem wedges taper towards the periderm and the parenchymal wedges towards the cambium. In peppermint and in the long-leaved box, oil glands develop in the parenchyma wedges.

Yet another type of bark is developed in red ironbark, the hard, black, furrowed rhytidome differing from all the other barks examined, in the presence of large pockets of kino. As soon as the smooth twig begins to give place to the rough-barked stem, which in its turn grows into the

flanged and furrowed trunk, the periderms begin to be discontinuous, becoming rugged and broken, interrupted by the development of extensive kino deposits which appear to come from the disintegration of the phloem tissue itself. In the young stems these cavities are bounded by many layered

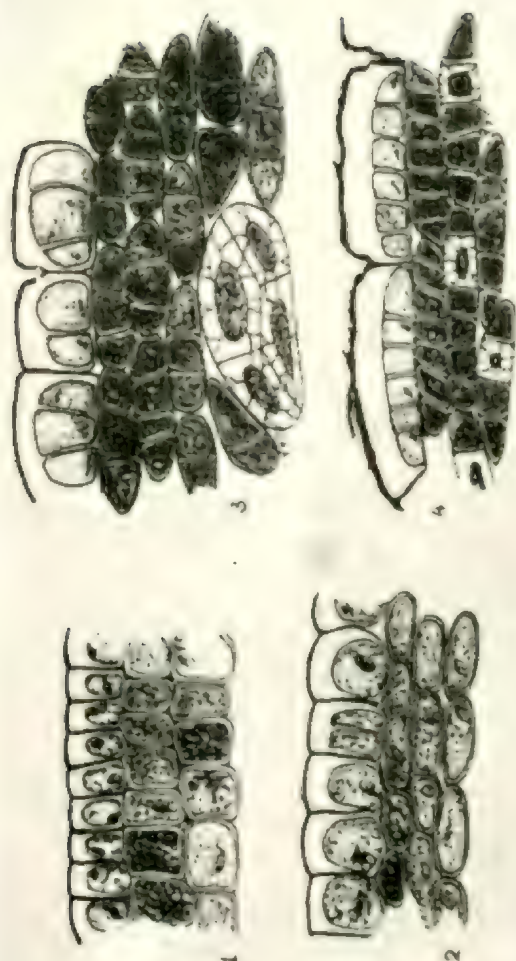


Fig. 2.—Cross-section of cortex of *Eucalyptus gigantea* Hook. 1-4. Progressive stages in growth and division of the cells of the outer cortex and epidermis ($\times 150$).

periderms, which are similar to those of the younger stems of this and other species of eucalypt. In still older bark the kino pockets are much more extensive and may burst the confines of the periderms, remains of which may be found here and there around their peripheries. The cohesion

of the bark of red ironbark into a hard mass is due to this impregnation with kino, which hardens on exposure to the air. The deep furrows, which are such a feature of ironbarks, begin to form early, when the young stem expands, and the phloem parenchyma and ray cells divide to form wedges of large-celled tissue. As the surrounding tissue becomes hard and rigid these wedges form weak places that give way very easily under the strain of expanding girth and consequently are the site of further cracking. These wedges of large-celled tissue are similar to those observed in the boxes and peppermints, but the greater rigidity and cohesion of the dead thytidonic in the ironbark ensures that the cracks always occur in the same place, and that little bark is lost through abrasion. In the boxes and peppermints there is a certain amount of "give" in the surrounding tissue, and the cracks are not always in the same place. The trunks of such trees are a network of small fissures instead of the fewer deep furrows of the ironbark.

It is possible that if more were known about the structure of bark another feature might be added to those which help in the identification of eucalypts. Bark is more accessible than wood and sufficient for examination can be taken off the outside of a tree without causing damage to the timber, or permanent disfigurement to the tree. Unfortunately the details of structure are not as easily seen with a penknife and hand lens as are those of the wood. It is often difficult to get a clean surface without embedding the bark in wax or celloidin, and even then the cutting requires a very sharp knife. But there is already some evidence that a survey of the barks of the different eucalypts is likely to help establish relationships and to assist in the separation of species which have very few distinguishing features in the wood.

(Reprinted from the *Forest Products Newsletter*, No. 190, 1952.)

A NEGLECTED TREE—BLACKWOOD WATTLE

(*Acacia melanoxylon*)

By (the late) JAMES RAILTON*

I should like to see the Blackwood planted more freely in this State. It has many qualifications for planting—uniform growth, evergreen dense foliage, disease and drought resistance. It forms a beautiful ornamental tree, and, being hardy, will accommodate itself to any soil. It is a deep rooter and grass can be grown quite close to the trunk. Although the majority of acacias are short-lived and cannot be recommended for street planting, the Blackwood is an exception and is planted in large numbers in the U.S.A. and other countries. The Blackwood is most suitable for cooler localities and should be given a fair trial. Unfortunately, in this country, it has not received the attention it deserves and few specimens are to be seen in our parks and along our highways. One reason for its scarcity is the slowness of its growth in the early stages, but when fully grown it forms a good-sized evergreen tree of pyramidal shape and dense foliage, and I have seen quite a large number of trees of 20-30 years old, perfectly uniform in shape.

The flowers are round and creamy white, on stalks over half an inch long, in short racemes of 3-5 flower heads; the seed pods are a reddish-brown and hang on the trees for months. It can be classed as a superior indigenous tree, and by far the best of the Wattle family for parks and for planting on the highways. Both for beauty, shade and utility the Blackwood could become an ornament to them.

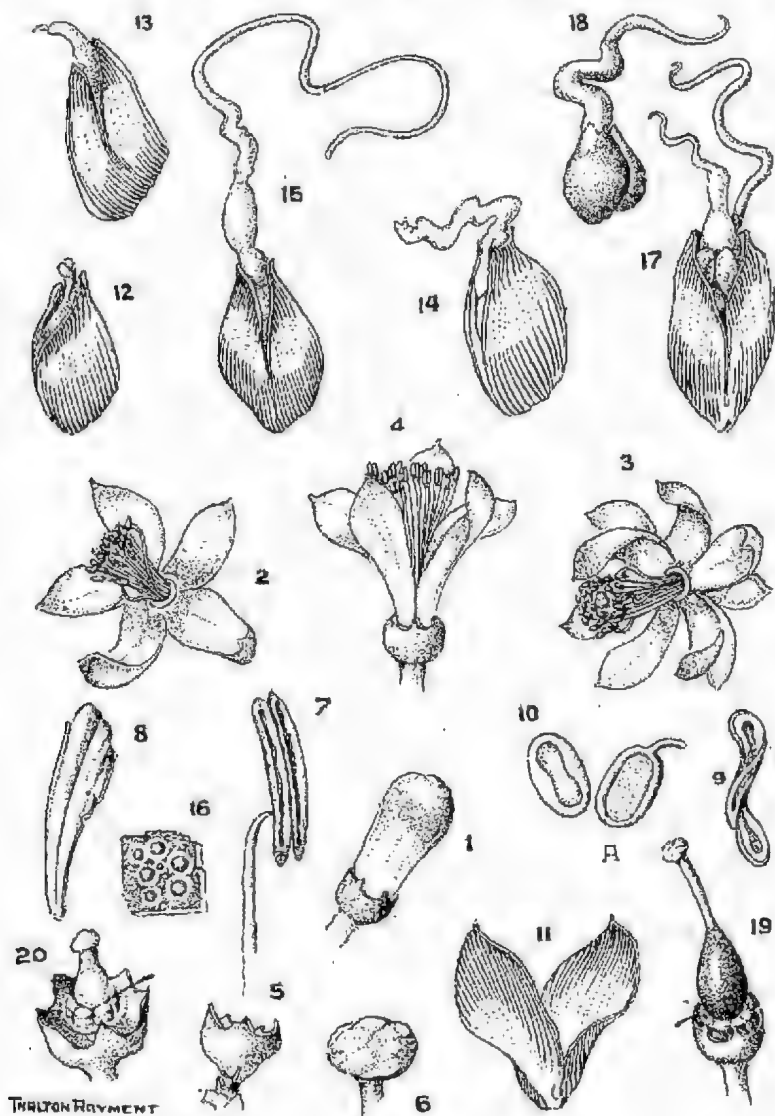
It also produces an excellent timber, often with fine fiddleback figure, that can be used for furniture, rail and trawlers, boat-building, billiard tables, piano furniture, and many other ornamental uses such as veneers, for which its capacity to take a fine polish especially fits it.

*Since this note was accepted for publication the death of Mr. Railton has been announced.—Ed.

PRECOCIOUS LEMON SEEDS

By TARLTON RAYMENT

The author is optimistic, perhaps simple enough to believe that a mere lemon-flower possess a world of interest for the true nature-lover. It is essential for the successful germination of certain seeds that they become thoroughly dried out before they are sown. Table peas, for example, belong to that class, for if they be planted in their soft green state the percentage



germinating will be very low indeed. Lemons do not, however, require to pass through such a "resting" phase, for the green "pips" will sprout vigorously even while the yellow fruit is still hanging on the tree.

At Toorak, three miles east of Melbourne, in the garden of our friend Lynette Young, there is a flourishing lemon tree, and on many occasions well developed fruits have been picked in which several "pips" had already developed a long, strong radicle—a few were showing the two green cotyledons; indeed, one testa contained two embryonic plants. Should the embryonic plants be allowed to remain in the fruit, they are soon destroyed by moulds.

In 1930, Miss Young planted one of the precocious seeds in a flower-pot, and it has grown so vigorously that the young plant is now ready to be transplanted to a permanent site. It will be interesting to study its future progress.

The author asked Miss Young to preserve for him any other growing seeds she might discover, and on March 28, 1933, another gravid fruit was found in which seven seeds were germinating. The largest radicle was nearly two inches in length, but several stages of growth were represented, and the drawings were made from the actual seeds before they were planted in a pot.

On examining the tree, the author found that it was bearing two types of flowers. The ordinary blossom had five petals and 38 stamens; the other kind had nine petals, with 28 stamens surrounding the green stigma. It was observed in the latter flowers that the filaments were frequently fasciated for their entire length, and at the apex there was the merest yellow line, and not a true pollen-producing anther. In the five-petal type the stamens are partially fasciated on the basal half.

It was observed, too, that the broad fasciated stamens exhibited many oil-dots, similar to those in the petals, demonstrating that such broad forms are tending to become petals, for there are no oil-dots in the normal stamens. Both kinds of flowers produce fruits that appear to be normal, and the author is marking a few of the flowers to ascertain whether or not it is the nine-petal flowers that produce the precocious seeds.

Of course, the green leaves too are covered with oil-dots, for the citrus family, Rutaceae, is famous for its ethereal oils yielding delicate perfumes. The family contains such plants as orange, *Boronia*, *Eriostemon*, *Cortec*, *Philotheca*, *Phebalium* and others.

Explanation of Plate 1—The attractive scented white bud of the lemon flower is suffused with amethyst colour. 2—The normal flower has five petals and 38 stamens. 3—The nine-petal form with its 28 stamens. 4—Lateral view of the five-petal flower. Both kinds are sweetly scented. 5—The green calyx with its five tiny sepals. 6—The green stigma at the apex of the white style (the pistil) is viscid, and so holds the pollen-grains from blowing away. 7—The normal stamen is white, and bears a golden anther. 8—the broad fasciated stamens produce no pollen. 9—The empty and effete anther turns and twists upon itself. 10—Some of the elliptical pollen-grains are white; others are golden with oil. "A" has a pollen-tube emerging. 11—The empty testa or seed-shell is tough and yellow. 12—The testa splits open. 13—And soon after the stout radicle emerges. 14—And continues to lengthen. 15—Until a tenuous root "hair" appears. 16—Portion of one of the fasciated and aborted stamens, showing the numerous oil-dots. 17—One of the seeds produced two embryonic plants. 18—One of the two embryonic plants, showing the long white radicle and the pair of stout green cotyledons. 19—The small green fruit appears at the base of the white pistil after the five stiff petals fall from the calyx. The nectary is indicated by the arrow. 20—After the petals fall, the nectaries can be seen easily.

NOTES ON EAST GIPPSLAND ORCHIDS

By N. A. WAKEFIELD

This subject was last dealt with in the *Vic. Nat.* of December 1950 (67. 166), and some additional records and notes are now available to bring the list up to date. The aggregate of East Gippsland orchid species now stands at 117, and the three additional species of *Prasophyllum* bring the total for that genus to 19, while the numbers of *Pterostylis* and *Thelymitra* remain unchanged at 22 and 18 respectively.

Prasophyllum parviflorum (*Vic. Nat.*, 57: 191, March 1941). A solitary, somewhat damaged specimen was found amongst *Xanthorrhoea hostilis* in the wildflower sanctuary at Marlo. (W. Hunter—Oct. 1951.)

Prasophyllum archeri was growing abundantly on the "Bare Rocks" above Boundary Creek, Wulgulmerang. It was associated in one place with *Chiloglottis reflexa*, and was otherwise here and there amongst the low sparse shrub growth which covers this remarkable rock outcrop. (N.A.W.—21.1.1953.)

Prasophyllum morrisii was observed growing abundantly on recently burnt heathy flats and low gravelly spurs, near the confluence of Weepon Creek and the Upper Genoa River, just within Victoria. (N.A.W.—15.1.1953.)

Caladenia pallida, though usually in the highlands in East Gippsland, was flowering well on an open forest spur at Mount Drummer and also just within Victoria near the Upper Genoa River, in each locality at only about 1,000 feet elevation. (N.A.W.—12/13.1.1953.)

Chiloglottis cornuta (Syn. *C. muelleri*) was found, growing as usual on *Dicksonia* trunks and in sedgy patches beside running water, in a jungly gully on the south-east slope of Mount Ellery at about 4,000 feet elevation. (N.A.W.—28.12.1951.)

Cryptostylis hunteriana. Since the report made in December, 1950, the known range of the Furred Tongue Orchid has been doubled by its discovery at two places east of the Camp River. There were a few plants near the Princes Highway at Reedy Creek, and over a score at Bottle Creek by the Tamboon Road. (N.A.W.—Dec. 1951.) The habitat was, as usual, in the *Xanthorrhoea hostilis*-*Casuarina paludosa* association; and the flowering was repeated in January, 1953.

In January, 1952, the writer noticed that a native bee was visiting, and apparently pollinating, *Prasophyllum australe*, on a sedge flat near the Thurra River. One particular bee visited several spikes of the orchid and had the complete pollinia of one flower attached to its thorax. Mr. Tarlton Rayment later identified the bee as *Exoneura hamulata*, one of the Reed Bees. (See *Vic. Nat.*, 63: 65—July 1946.) It was interesting to see that this particular insect restricted its attention to the Leek-Orchids, while all the other bees there, presumably of the same species, were working the flowering spikes of *Xanthorrhoea minor*.

At "Diggers Holes" on the Nunniong Plateau *Pterostylis cyenocephala* was flowering well on January 5, 1949. Fifteen miles south of that spot, at Bentleys Plain, *Eriochilus cucullatus* was in full flower on January 26, 1953. Both localities are in the snow country at over 4,000 feet elevation, and the two orchids—which flower in the lowlands in spring and autumn respectively—bloom simultaneously in mid-summer at Nunniong to avoid the alpine snows of their normal seasons.

BIRD PROTECTION

Country Life (Dec. 12, 1952) notes that a bill will be introduced shortly to the British Parliament to resolve the present state of chaos and give birds a protection that has in the past been only theoretical. Members who

have been in England and recall the size of the English counties will understand how necessary such legislation is, especially when they learn that not only do the close seasons for wild birds vary from one country to another, but that a bird may be protected in one county and not in an adjoining one. For example, in Berkshire the little owl may be killed with impunity, whereas in Buckinghamshire it may not. Woe betide the little owl that gets off its course on a dark night and inadvertently crosses the county border!

What is now needed is not only uniform legislation, but some means of enforcing it. It is hoped that this will be provided in the new bill, and that, reinforced by a growing public opinion that no longer tolerates the robbing of nests or the shooting of rarities—except with a camera, a happier day may be in store for British birds.

May Australia soon follow suit, even though the uniformity would have to cover so much larger an area, and problems of enforcement would be multiplied so many times.

M. M. CHATTAWAY.

WHIPSTICK ORCHIDS—TWO NEW RECORDS

Although the Tall Greenhood (*Pterostylis longifolia*) and the Nodding Greenhood (*P. nutans*) are common throughout Victoria, they were not included in the late D. J. Paton's census—"The Plants of the Whipstick Scrub, Bendigo" (*Vict. Nat.*, 40: 10—Feb. 1924), nor were they recorded by J. W. Audus or the late A. J. Tadgell who listed further Whipstick species.

Last July, both orchids were discovered near Lightning Hill on the southern fringe of the Whipstick, each in two different localities.

The Tall Greenhood, in both instances, was found near Red Stringybark trees (*Eucalyptus necorrhyncha*), and I am wondering if any other naturalists have recorded an association between these two species.

The Nodding Greenhoods were found in the broken ground of old mine workings which probably date back to last century. As this orchid has yet to be found in virgin ground in the Whipstick area, and as its only other occurrence known to the writer in the Bendigo area is south of One Tree Hill, about nine miles distant, could it be that *P. nutans* is a recent introduction to the Whipstick?

W. PERRY, Eaglehawk.

PLANTING AT MARANOA GARDENS

Over 60 members and friends attended the Club excursion on April 11, and enjoyed the balmy autumn afternoon. The lack of flowers gave more leisure to appreciate the varied foliage, looking particularly attractive despite the dry late summer. The Chairman of the Committee for Beckett Park and Maranoo Gardens, Cr. August, welcomed the visitors and thanked them for their continued interest.

In view of the very dry season and the probability of continuance, the Committee limited the number of plants, but about 60 were available. Of special note were *Hakea purpurea*, *Grevillea juniperina* var. *rubra*, *Prostanthera cuneata*, *Grevillea rosmarinifolia*—the Hurstbridge form, *Grevillea sericea*—similar to *G. linearis* but deeper in colour and in flower throughout the year, and trial seedlings from Miss I. Nethercote's beautiful *Leptospermum scoparium*. This was believed to be the result of crossing of *Leptospermum laevis* and *L. scoparium* var. *nicholii*, but, of 30 seedlings, none have shown any characteristic of *L. laevis*.

Afternoon tea was provided by Maranoo Committee. The Club President, Dr. Chattaway, briefly thanked the Committee.

A. J. SWABY, Leader.

TWO NEW SPECIES OF TASMANIAN MOSSES

By G. O. K. SAINSBURY, Wairoa, N.Z.

The two species, described below as new, are founded on Tasmanian specimens in Rodway's herbarium, collected by him and labelled respectively "*Dicranum* sp." and "*Blindia arcuata* Br. & Sch." The former moss is closely allied to the widely distributed *Dicranoloma Billardieri* (Schwaegr.) Par., but has a strikingly different perichaetium, whilst the latter is entirely distinct from *Blindia magellanica* C.M. (of which *B. arcuata* is a synonym). It should be added that Mitten was the author of the last-named species, and that both *B. magellanica* and *D. Billardieri* occur in Tasmania and New Zealand. The types of both species are in my collection and in the herbarium of the University of Tasmania, Hobart.

DICRANOLOMA PERICHAETIALE Sainsb. sp. nov.

Sat robustum, dense caespitosum, aureum. Caules plerumque simplices, ca. 5 cm. alti, apicibus cuspidatis. Folia 7-10 mm. longa, et 1.1-1.3 mm. lata, ad apicem caulis conferta et leniter falcato-secunda, ovato-lanceolata, longe subulata, valde concava, haud plicata, apicem versus nonnunquam obsolete denticulata. Costa angustissima (forma *Leptonervon*), 25-30 mic. lata, apicem versus dorso denticulata, excurrent vel percurrent. Cellulae elongatae, incrassatae, parietibus porosis, ad marginem laminae angustissimae, limbum angustum hyalinumque instructas. Cellulae alares magnae, fuscae vel hyalinae. Perichaetium longissimum, ad thecam attingens, bracteis convolutis in subulam setaceam contractis. Seta ca. 1 cm. alta. Theca ca. 2 mm. longa, sicca incurva, subrecta, estrumosa, operculo longirostri. Peristomium generis. Spori ca. 18 mic.

Hab.: On logs, Zeehan, Tasmania. Coll.: L. Rodway (63a)—date not given. Herb. Sainsbury, No. 16722 (TYPE).

Apart from the inordinately long perichaetium I can find nothing in this plant to separate it from *D. Billardieri*, at any rate if a broad view be taken of that species; but the material is scanty and there may be differences that have escaped me. *D. calycinum* Broth. & Par. from New Caledonia also has a greatly lengthened perichaetium, but the leaf there has a much wider hyaline border which is continued almost to the apex; the nerve is twice as wide and the leaf cells are shorter. In Rodway's "Tasmanian Bryophyta", Part 2 (*Papers and Proc. Royal Soc. Tas.* for 1912, p. 102) he gives a var. *angustinerve* of *D. Billardieri* as having the nerve very narrow, and the seta "encased in the perichaetials to or almost to the capsule", and he goes on to say that this plant is common. The variety is perhaps intended to replace Mitten's *Dicranum angustinerve* which, though founded on Tasmanian material, is not mentioned specifically in Rodway's work. This species was considered by Dixon ("Studies in the Bryology of New Zealand", No. 1, p. 25) to be a synonym of *D. Billardieri*. It was not described by Mitten as having a particularly long perichaetium, a striking feature on which he could not have failed to comment, so I do not think that it can possibly be identical with Rodway's variety. There is no named specimen of the latter in his herbarium which would settle the question whether or not the Zeehan moss and the variety are identical; and in such a highly critical genus as *Dicranoloma* the description given is really not adequate for that purpose. In any event, the name used by Rodway could not be applied to the new species.

BLINDIA TASMANICA Sainsb. sp. nov.

Eubindia. Dioica. Sat robusta, nigrescens. Cautis usque ad 4 cm. altus, simplex vel superne ramosus. Folia 5-6 mm. longa, falcato-secunda, rigida, concava, e basi anguste ovata sensim vel raptim in subulam longissimam,

rigidam, integram, obtusam angustata. Costa robusta (circa 150 mic. lata), subulam omnino implens. Cellulae laminae 60-100 mic. longae, circa 8×1 , sat incrassatae, haud porosae; cellulae alares haud diversae. Seta circa 1 cm. alta, crassa, fere erecta. Theca ca. 1 mm. longa, pallide fusca, cyathiformis, pachydermatica. Annulus male evolutus. Peristomii dentes rubri, superne valde papilloso, ibi plerumque bifidi. Operculum systylatum, longe oblique rostratum. Calyptra cucullata, ad basin thecae producta. Spori 28-32 mic., laeves, pallide virides.

Hab. Cradle Mountain Tasmania. *Coll.*: L. Rodway Dec. 1916. Herb. Sainsbury, No. J6549 (TYPE).

The long, solid arista recalls that of *B. conlecta* (H.J. & W.) C.M.; but the leaves there are straight, the cells much shorter, and the capsule immersed. The operculum when dry is concave and shrivelled, as in *Trochobryum*, and its attachment to the columella is a particularly striking feature. This character is also exhibited in *B. Myer-Dreesii* Bartr. from New Guinea, but that is a much smaller plant with leaves weakly nerved and highly differentiated alar cells. Mr. E. B. Bartram, who has kindly examined the Tasmanian moss, confirms my opinion that it is a new and distinct species.

LET'S HAVE MORE ALL-AUSTRALIAN GARDENS

"Maranoa" was preserved for the public through the influence of some of our veteran members. Right through its development Field Naturalists have been active with guidance and hard work. The future progress will depend on our support. Members are requested to keep up their interest and to ensure that their friends are introduced. The Camberwell City Council will be encouraged to spend more on the Gardens if they are visited by large numbers. We must bring the visitors:

"Maranoa" does not suit a great many of our best plants. If Melbourne is to have the best possible representation, we must have supplementary gardens in the sandy loam and somewhere in the Dandenongs.

Cheltenham Park seems likely to provide the sand area. A planning committee is working under Moorabbin City Council. It has been agreed that the north-east portion shall be devoted to a garden of the best small trees, shrubs and smaller plants likely to succeed in sand. All concerned are emphatic on the condition that the informal "bush" appearance shall be maintained, with the indigenous plants of the area giving a foundation.

South of the garden area, many of the plants of the "red sand" area still flourish. This section has been marked for preservation as a "primitive" area. The only planting will be the restoration of species not now found there.

While plans are well advanced, two factors are causing delay. Moorabbin has a vast area of new homes with unmade streets, and money is simply not there at present for developing the garden. Willfully destructive children exploit their nuisance value. Until money is available, either from Council or the State, the Committee will do what can be done by voluntary helpers. The tendency to vandalism may be checked by a roster of an auxiliary body to have someone supervising at week-ends and during holidays.

Here, Field Naturalists can help. If they live handy to Cheltenham, Committee will be glad to have their assistance. If not, they may know people down there. In any case, we can mention the matter wherever we may be. The prospect of a garden in Cheltenham is too opportune for us to let it go.

Lastly, what can we do to get a garden in the Dandenongs for ferns and forest flora? That is for readers to discuss. The writer will be glad to have suggestions.

A. J. SWABY.

NATURALISTS' NOTE-BOOK

(This space is for your Natural History observations, notes and queries.)

AN ATTRACTIVE BIRD

The black-faced cuckoo shrike (*Coracina novaehollandiae*) with its coat of light grey and its black head to form a striking contrast must be one of our most attractive birds. These birds are numerous in the area between Sandringham and Cheltenham, probably because the golf links provide open spaces to their liking. They are fond of resting on the electricity wires. They have an undulating flight and, after alighting, they lift their wings and then lower them into position again.

—A.E.B.

EFFECT OF EXPLOSION AT DEER PARK

On Sunday, February 1, when a large quantity of gunpowder blew up at Deer Park, I was at the salt marshes at Altona, some 8 to 10 miles distant. At this time of the year, large groups of wading birds gather there before starting off on their long migration journey northwards, and hundreds of duck and other water birds arrive as summer heat dries up the shallower waterholes in the surrounding country.

At the time of the explosion, about 4.20 p.m., we happened to be facing towards Deer Park and saw the long column of smoke shoot up and "mushroom" at the top. After an appreciable time, the sound waves reached us as two dull "booms". Instantly the air was full of wheeling masses of birds. (Our census figures for that day indicated that there were about 10,000 individual birds in the area. They kept generally in small flocks, mostly each of the same species, though some were mixed. There was one large flight of Sharp-tailed Sandpipers, a dense mass which wheeled and changed course in the inimitable fashion of that species.

They settled again after a short time, but for those few minutes it was fascinating to watch the moving tapestry of flight pattern of the different flocks and various speeds of flight, and to hear the air filled with the sound of wings.—I.M.W.

DWARF SUGAR GUMS

Although the recently developed Dwarf Sugargum (*Eucalyptus cladocalyx nana*) has proved very successful in the dry interior, it is not so suitable for planting near the coast or in areas of high humidity.

It grows about twelve feet high and is quite bushy, but many specimens on my property at Sandringham have been attacked by a fungus parasite (*Sphaeropsis malorum*) which causes the condition known as "Black Rot" or "Stem Canker" in apples and other trees. It must therefore be concluded that the Dwarf Sugargum should be planted in the areas which also suit the common tall Sugargum.—A.E.B.

WHAT, WHERE AND WHEN

General Excursions:

Sunday, July 12—Sherbrooke Forest. Subject: Lyre Birds. Leader: Miss Ina Watson. Take 8.45 a.m. Upper Ferntree Gully train, then Olinda bus to Memorial Gates. Bring one meal.

Group Fixtures:

Tuesday, July 7—Geology Discussion Group. Meet at Russell Street entrance of National Museum, 7.30 p.m.

KENNETH W. ATKINS, Excursions Secretary.

The Victorian Naturalist

Vol. 70—No. 3

JULY 9, 1953

No. 835

PROCEEDINGS

The Annual General Meeting of the Club was held at the National Herbarium on Tuesday, June 8, 1953. It opened with Dr. Chattaway in the Chair and about 125 members and visitors present.

Mr. Clyde Sykes, of Gelantipy, was elected as a Country Member of the Club.

The Secretary's Annual Report was read, received and adopted. In the absence of Miss Fletcher, Mr. Chalk read the Treasurer's Report, which was duly received and adopted. Both these reports may be found elsewhere in this issue.

Mr. Hooke, one of the Auditors stated that the credit balance for the past year offset only part of the aggregated debit balances of the previous several years. The remaining leeway should be made up by strict control of finances, until certain liabilities were covered by a credit in the Club's working bank account.

There being only one nomination for the Presidency, Mr. A. A. Baker was duly declared elected, and Dr. Chattaway vacated the Chair in his favour. The President then declared elected those nominated for official positions and Council. Names of these new officials are published on the inside back cover of the *Naturalist*.

Mr. Baker commended the work of other members, particularly Messrs. Garnet and Burston in connection with the National Parks Association, Miss Wigan and Mrs. Freame as assistants in the Youth Movements, Mr. Willis of the Plant Names Committee, and Mr. Swaby on the Maranoa Gardens Committee. Mr. Coghill and Miss Young proposed a vote of thanks for the work of the retiring Council, and especially that of the Treasurer, and Mr. Garnet supported the motion.

Messrs. Chalk and Hooke were re-elected as Auditors for 1953/54.

Dr. Chattaway informed the meeting of an offer to the Club of 80 acres of bushland at Upper Beaconsfield. Information about this can be obtained from Council members, and the matter will be brought up later at an Extraordinary General Meeting.

Mr. Willis reported the publication of Parts 3 and 4 of the Australian Geographical Society's reports on the natural history of the Recherche Archipelago, copies of which booklets may be bought from the Club Librarian.

Miss Wigan reported that about 30 plants or donations (3/6 each) were still required by Mr. Lord for the planting scheme in Wattle Park. Suitable plants are listed in the May *Naturalist*.

Dr. Melville, of the Kew Royal Botanic Gardens in England, showed the meeting a number of varied and interesting colour slides, both scenic and botanical, of his journeying in the eastern States of Australia. Dr. Chattaway and Mr. Fisch proposed a vote of thanks expressing the Club's appreciation and wishing him a pleasant return trip to England.

The meeting closed at 9.50 for the conversazione and examination of exhibits.

EXHIBITS AND NATURE NOTES AT JUNE MEETING

Botany

Specimen of Woolly Wattle, *Acacia lanigera*, from Red Ironbark forest near Hendlign. An attractive early winter-flowering wattle, of erect shrubby form—Mr. H. Stewart.

Conchology

Shells from Barrier Reef: *Mitra pontificalis*, *Mitra episcopalis* and *Terebra maculata*—Miss McPhee.

Geology

Granite—with Variations: *Orbicular Granite*, with concentric layers of mica and white felspar, known from Kangasala in Finland and more commonly at Karamca and Wangapeka River in N.W. of South Island of New Zealand. *Graphic Granite*, with intergrowths of quartz in felspar, resembling ancient Hebrew writing—specimens from Painted Canyon, Benstead Creek, Northern Territory, and Balmoral, Victoria. *Granite Pegmatite*, with the quartz, felspar and mica developed to much larger sizes by more fluid solutions cooling slower—Wodonga, Vic. *Granodiorite* showing xenoliths which are portions of the rock through which the granite magma was forced—Harcourt, Vic. Also specimens of Micro-Granite, Heathcote; Green Granodiorite, Dromana; Granite Porphyry, Murray Bridge, S.A.; Granodiorite, Somerton (the nearest worked granite to Melbourne), and various other Victorian and overseas specimens—Mr. Baker.

GEOLOGY GROUP

The June meeting was held at the National Museum, 16 members and visitors being present.

Excursion to the cliff exposure on the Moonee Ponds Creek, 100 yards upstream from the bridge at Brunswick Road, West Brunswick: Mr. Baker reported that in the upper beds fossils of Brachiopods, Gastropods, Cephalopods and Crinoid stems were easily obtained, being well preserved in the sandy mudstone. In the lower beds, preservation was poor, the stratification showing evidence of slumping. Thin layers of a clear mineral, probably Hyalite (opaline silica) were obtained from the joint planes of the rocks. The age of this exposure is Upper Silurian (Melbournian).

Mr. A. B. Scott reported that a piece of wood collected on the May excursion to the Boulevard, Essendon, had a bored hole in which the shell of a wood-boring beetle remained. Mr. A. N. Burns, of the National Museum, Melbourne, considered it to be a Longicorn. The wood, Red Gum, which was partly charred, had also the borers holes and fragments of marine borers in it.

The subject for discussion, given by Mr. A. M. Cobbett, was Granites: dealing fully with the early history, texture, mineralogy, classification and methods of quarrying.

Correction.—In the last report (June *Naturalist*, p. 18) the name "N. E. Tindale" was inserted in error for "F. B. Tindale".

SEVENTY-THIRD ANNUAL REPORT, 1952-53

Your Council has pleasure in submitting the 73rd Annual Report of the Club. Our membership now consists of a total of 434, being 278 ordinary members, 132 country members, 19 honorary and 5 life members. Amongst those whose passing during the year we have had to mourn were Sister Melville, Mr. T. C. Bryan, a vice-president, Mr. W. F. Gates at the age of 96, and Mrs. J. G. Edmondson, the last two having been honorary members of the Club. During the year honorary membership was conferred on Messrs. L. W. Cooper, V. H. Miller and the Rev. H. M. R. Rupp for their long and honourable service to the Club. The Australian Natural History Medalion for 1952 was awarded to Professor J. B. Cleland, of Adelaide, who was nominated by three organizations in South Australia. The lectures given and papers read during the year have been interesting and varied and thanks are expressed to those who have assisted in this way.

Two very important events were associated with the Club's activities during the last twelve months. First, the special Lyre Bird issue of the *Naturalist* in September was an event which reflected credit on all those concerned. This special number was made possible by a grant of finance from the Ingram Trust whom we thank for their help. The other important feature was the Symposium on National Parks which was arranged by Mr. A. W. Hurston, a committee member of the National Parks Association. This occupied two evenings and several members contributed items. During the year the Government introduced a Bill into the Legislative Assembly, dealing with, amongst other things, the National Parks of Victoria. The Bill had many faults from our point of view and because of a change of Government and subsequent election, was withdrawn, to be replaced later on, we hope, by a more acceptable measure. Another important event connected with this subject was the formation during the year of a National Parks Association, with Mr. P. Crosbie Morrison as President and Mr. J. Ros Garnet as Secretary. It is hoped that this step will in the not too distant future put the National Parks of this State on a much more satisfactory and sound footing.

The problem of the trees on St. Kilda Road has received attention and your Club's views have been expressed by the President and others to the proper authorities, so that it looks now as if the Desert Ash will not find a place in this lovely avenue.

A very good piece of work initiated by the ornithological clubs and supported by members of our Club is the survey of the habitat of the Helmeted Honeyeater. It is a pity that more work of this nature is not undertaken.

Our Journal, *The Victorian Naturalist*, under its new Editor has undergone some changes. Reasonably adequate revenue has

enabled us to dispense with the inside advertisements, thus allowing more reading matter. The Editor is very desirous of giving us a balanced magazine, and would appreciate more notes on Zoological subjects.

The Royal Society having decided to rebuild its hall in Latrobe Street which stored our Library and was the meeting place of the Club groups, it has been necessary by the kind permission of Mr. Jessop to transfer our books to the Herbarium where they are unfortunately not available for loan to members. The only group now meeting, the Geology Group, meets at the Museum, and reports a very successful and active year of study and work.

The provision in our Constitution and By-laws for affiliations has resulted this year in three organizations being granted affiliation, the "Save the Dandenongs" League, and the Maryborough and Frankston Field Naturalist Clubs. Other Clubs in the country have sought information on this subject.

The increased annual subscription, having been in force for one full year, has enabled your Council at last to balance its budget and finish the year with a small credit balance. A number of members resigned because of the increase to £2 per annum, but we have been pleased to welcome quite a number of new members. The credit balance is not large enough to justify at present any reduction in the annual subscription because the cost of printing the *Naturalist*, which is our main item of expenditure, shows no signs of declining, but let us take satisfaction in the fact that we are now holding our own financially. An increased membership would be advantageous, and if every member who has a friend likely to be interested in Natural History would propose him or her, that would be helpful.

Our old friend, Mr. George Coghill, during the year celebrated his seventieth year of membership and active service with the Club. Such a record is something to be really proud of. He was presented with a framed illuminated address to mark the occasion. What a pity there are not more of his calibre.

Two members of the Council who have rendered faithful service to the Club will be retiring this year. They are Miss Watson and Miss Wigan. Sincere thanks are due to them both for jobs well done.

Your Council has again had great difficulty in getting members to fill the various positions which fall vacant annually. For the seventeen vacancies requiring to be filled, only eight nominations were received, leaving the balance to be filled by the Council itself. This is an entirely unsatisfactory state of affairs. Let us see if next year we cannot improve the position.

It is now quite a long time since the Club held a Nature Show. But this year our energetic Editor offered to organize one and

has obtained the use of the Prahran Town Hall. We know you will all be anxious to co-operate with him and help in every way possible to make the function a success.

Finally, we must again express our thanks to all who have helped the Club in the past year; particularly we thank Mr. A. W. Jessep for the use of this fine hall for our meetings, and Mr. Otto, of the *Sun News-Pictorial*, for help in connection with advertisements in the *Naturalist*. We are grateful to the Royal Society for the use of the Lower Hall for the storage of our Library, which we trust will be going back there after the alterations have been completed.

On behalf of the Council,

F. LEWIS, Hon. Secretary.

NATURE SHOW

Our Australian Nature Show is to be held in the Prahran City Hall from Monday 19th, to Wednesday 21st October, 1953. A number of government bodies, natural history and other clubs, as well as many individuals, are co-operating to provide a diversity of interesting and unusual exhibits. A full report of the organization to date will be given at the July General Meeting, and a list of volunteers will need to be compiled then for the many small tasks involved during the actual staging of the Show. Members are requested to give this serious consideration in the meantime, as ultimate success will depend, not only upon those who are putting several months' effort into the exhibits and the organization, but also upon the team of volunteers who are each available for an hour or so at critical times.

—N. A. WAKEFIELD.

F.N.C.V. EXCURSION TO WERRIBEE GORGE.

Club members visited Werribee Gorge on March 14, 1953, travelling from Melbourne by train and taking cars from Bacchus Marsh railway station for about $5\frac{1}{2}$ miles along the Western Highway to a gate opposite the confluence of Myrning Creek with the Werribee River; whilst the return journey from near the weir was also facilitated by car transport along four miles of bitumen road. Thus the distance actually walked was little more than six miles, including at least a mile each way along the more difficult section of the gorge.

Various geological features of the surrounding country and in the gorge itself were viewed from several elevated vantage points, before the party descended past the upper shelter shed down several hundred feet to the Werribee River. Upstream, and also down along the irrigation channel for Bacchus Marsh district, many items of geological and botanical interest were observed at close range.

Notes on the physiography and geology of this area were read to the party at the lunch spot. These are published in this issue for the interest and instruction of other members, particularly any traversing the famous gorge. In 1914 there was issued an inch to the mile geological sketch map, which is recommended as a valuable guide to the Werribee Gorge and adjacent country.

—A. W. BURSTON.

FIELD NATURALISTS CLUB OF VICTORIA
STATEMENT OF RECEIPTS AND PAYMENTS FOR 12 MONTHS ENDED APRIL 30, 1952
GENERAL ACCOUNT

38

Receipts and Payments, 1952-53

[Vict. Nat.
Vol. 70

RECEIPTS		PAYMENTS	
Subscriptions—		<i>The Victorian Naturalist</i> —	
Arrears	£17 3 6	Printing	£560 10 0
Current	717 17 7	Illustrating	83 18 0
Life Membership	8 10 0	Despatching	27 13 11
		Index	12 10 0
	£743 11 1		£684 11 11
Sales of <i>The Victorian Naturalist</i>	6 6 4	Reprints	0 15 7
Advertisements in <i>Naturalist</i>	69 7 6	Postage	34 19 3
Interest received—Library Fund	1 12 6	General Printing and Stationery	27 2 6
Donations received	140 12 0	Library	15 18 0
Sales of Census of Victorian Plants	1 10 0	Rent and Caretaking	18 15 0
		Donations	2 17 0
		General Expenses	15 4 5
			£800 3 8
		Surplus of Receipts over Payments for the year	162 15 9
	£962 19 5		£962 19 5

BUILDING-AND CONTINGENCIES ACCOUNT

Balance in Bank on 30/4/1952	£30 17 1	Cost of Printing Amendments to By-laws	£3 15 11
Interest on Investments	31 16 3	Bank charges and interest	1 4 8
Sale of Publications	21 13 7	Balance in Bank on 30/4/1953	83 8 4
Sale of Badges	4 2 0		
	£88 8 11		£88 8 11

LIFE MEMBERSHIP ACCOUNT

Balance in Savings Bank on 30/4/1952	£49 19 0	Taken into ordinary income of year to 30/4/1953	£8 10 0
Interest on current account	1 2 5	Balance in Savings Bank on 30/4/1953	42 11 5
	<u>£51 1 5</u>		<u>£51 1 5</u>

July
1953

BALANCE SHEET AS AT APRIL 30, 1953

LIABILITIES		ASSETS	
Building and Contingencies Fund	£1,033 8 4	Bank Current Accounts	£173 11 2
Dudley Best Library Fund ..	50 0 0	Arrears of Subscriptions, estimated to realise	60 0 0
	<u>£1,083 8 4</u>	Sundry Debtors	32 5 0
Subscriptions paid in advance—		Stocks on hand at valuation—	
Ordinary	£92 11 6	Publications	£166 0 0
Life Membership	42 11 5	Badges	26 0 0
	<u>135 2 11</u>		<u>192 0 0</u>
Excursion Account	69 12 7	Investments, at face value—	
Special Donations in hand	31 14 9	Dudley Best Library Fund:	
Surplus of Assets over Liabilities	<u>1,168 11 8</u>	Commonwealth Bonds	£50 0 0
		Building and Contingencies Fund:	
		C'wealth Bonds	£950 0 0
		E.S. & A. Bank	
		Account	83 8 4
			<u>1,033 8 4</u>
		Library, Furniture, Epidiascope, Loud Speaker	1,083 8 4
		and Water Colour Paintings, at valuation ..	947 5 9
	<u>£2,488 10 3</u>		<u>£2,488 10 3</u>

Balance Sheet, 1953

Audited and Found Correct.
A. S. CHALK } Hon. Auditors.
A. G. HOOKE }

June 5, 1953.

N. FLETCHER, Hon. Treasurer.

THE WERRIBEE GORGE

By A. W. HURSTON

(Notes Read to F.N.C.V. Excursion on March 3, 1953)

Werribee River

The Werribee River is about 70 miles long with its source near Bullarto. Between Ballan and Pyke's Creek it flows in a valley about 150 feet deep, cutting the volcanic plain, and exposes small patches of Ordovician sandstones, Permian glacials, river gravels, etc.; and in places cuts through deep basalt. The grade steepens below Pyke's Creek, cutting downwards through hard grano-diorites and Ordovician beds, to form a precipitous gorge for the next three miles, to the confluence with the steep-graded Myrniong Creek near the east end of "The Island". The gorge continues onwards for about $2\frac{1}{2}$ miles.

The river emerges from the Ordovician rocks at the mouth of the gorge, and in the softer rocks hereabouts many tertiary and decomposed older volcanics, as well as river terraces, are found. The river is wider, and the land of greater economic value.

Beyond this, the river valley widens out into the fertile flats of the Bacchus Marsh basin. It runs through alluvium in a channel from two to twenty feet deep, and is joined in succession by the Parwan (from S.), Lerderberg R. and Coimadai Ck. (from N.). It then turns south from the flats to enter once more a narrow valley, cut into the basalt, in which the Melton Reservoir is located.

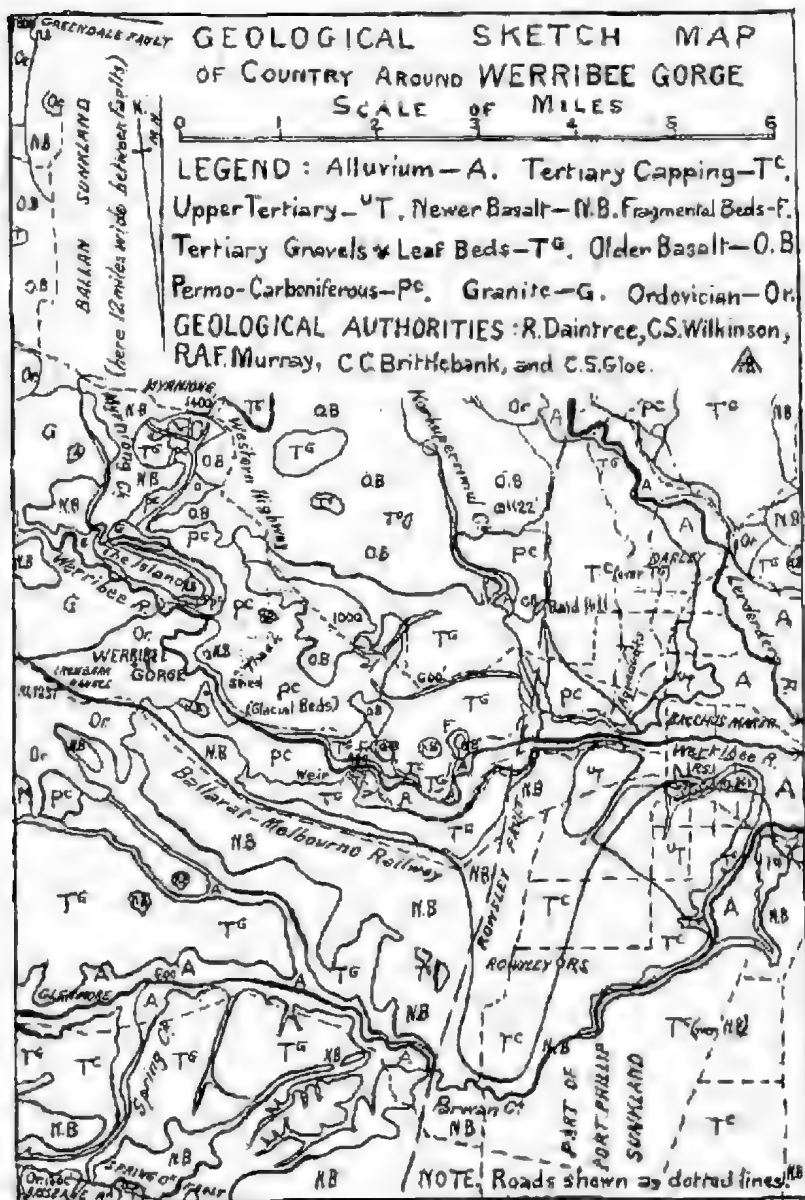
Topography

The topography of the Werribee Gorge area is mainly the result of extensive faulting giving rise to areas of uplift and sinking. This is the principal factor in determining the large scale erosion of the gorge, the stream dropping from the Ballan sunkland to the lower Port Phillip sunklands over the Rowsley fault line. The changes of grade have caused extensive cutting back which has formed the narrow gorge, and the depositing of deep soils near the Bacchus Marsh flats.

Physiography and Geology

In early Tertiary times this area formed part of the great peneplain of Eastern Australia, which plain was subsequently destroyed by differential uplift along several well-defined faults. The upthrown blocks of the Brisbane Ranges to the south, and the Blackwood Ranges to the north, and the Gisborne Highlands to the north-east, are geologically relatively simple, each being made up of rocks of Ordovician age covered by several long tongues of newer basalt. The downthrow blocks are the Ballan sunkland and the Werribee Plains—part of the Port Phillip sunkland, and largely volcanic. The wide variety of rocks and geological features found in the Ballan sunklands have interested geologists since they were first surveyed over 85 years ago.

In Lower Ordovician times, much mud and sands were deposited in seas which covered this area and later receded to the east. Uplift here was followed by folding, producing great mountain ranges and initiating long periods of erosion. In Devonian times, these sediments were intruded by a granitic magma with its acid dykes, the granite rocks being later exposed by denudation. In Permian times, with colder temperatures, glaciers moved over the land. During recession of the glaciers, fluvio-glacial conglomerates and sandstones were deposited in glacial rivers and lakes, and great masses of morainic material were left in the old valleys. Triassic sandstones were laid down on these glacial beds. Possibly some earlier movements along the Greendale (to N.) and Soring Ck. (to S.) faults let down the Ballan sunkland and so protected the glacial beds from complete removal by erosion. By early Tertiary times, the area was



reduced to a peneplain, partly destroyed by outpourings of flows of Older Basalt. Differential uplift along the Greendale (to N.), Gisborne and Coimadai (to N.E.), and Spring Ck. (to S.) faults then produced the raised blocks of the Blackwood (or Lerderberg) Ranges (to N.), the Gisborne Highlands (to N.E.), and the Brisbane Ranges (to S.), together with the Ballan sunklands and those of the Werribee plains. With the dissection of the raised blocks, coarse fault aprons were deposited near the scarps, and up to a thousand feet of finer sediments were laid down at some distance from the fault lines. These latter include lignites, in places interbedded with Miocene marine clays and limestones, and also Miocene sands and ironstones with leaf impressions. Extensive Newer Basalt eruptions then filled valleys in the uplifted blocks, and practically covered the sunklands. Associated was movement along the Rowsley Fault, which, besides increasing dissection of the Ballan sunkland, led to the formation of the narrow Werribee Gorge and the wider Parwan Basin. The differences in shape, area and depth of the narrow gorges and wide valleys are due to the variation in hardness or erodibility of the formations through which the streams flow. A widespread though thin fault apron was deposited along the base of the Rowsley Scarp, as was alluvium along the Werribee and Parwan just above the fault; whilst the recent alluvium of the flats nearer Bacchus Marsh was also formed at that time.

Geological Formations Represented

Ordovician Sediments form the bedrock of this area, outcropping for a few square miles in the Werribee Gorge. The hard slates and sandstones here have been indurated by granitic intrusions. Their general resistance to erosion can be seen in the gorge with its high cliff-like sides.

Devonian Granite outcrops (of adamellite) occur in a few square miles in the Werribee Gorge near Ingleston, above the Myrning Creek junction, forming well-rounded hills fairly resistant to erosion.

Permian Glacial Beds: Numerous outcrops, none more than a few square miles in extent, are exposed in the Ballan sunkland. These rocks consist of true tillites, with conglomerates and sandstones, having been preserved from erosion where protected in the sunklands. Elsewhere, on steep hill-sides, sheet erosion is very advanced.

Triassic Sandstones: A limited outcrop—one of the few known in Victoria—occurs on the eastern slopes of Bald Hill near Bacchus Marsh.

The Older Volcanic Series: These rocks are mainly confined to the Ballan sunkland between the Greendale Fault and the Werribee River, and comprise basalts, decomposed to rich red-brown loamy clays of considerable depth and fertility, and of excellent structure and porosity.

Miocene Sediments include marine clays and limestones (which do not appear at the surface), and fluviatile sediments (Tertiary Leaf Beds), and are confined to sunklands. These rocks include boulder deposits, sands and clays, ferruginous sandstones and mudstones, and limonite, mostly poorly cemented and easily eroded.

Beds of *brown coal* are found close to the surface near Bacchus Marsh. Several open cuts are operated at Maddingley.

The Newer Volcanic Series: Newer Basalt covers large portions of the sunklands, and the rock is generally dense and well-crystallized.

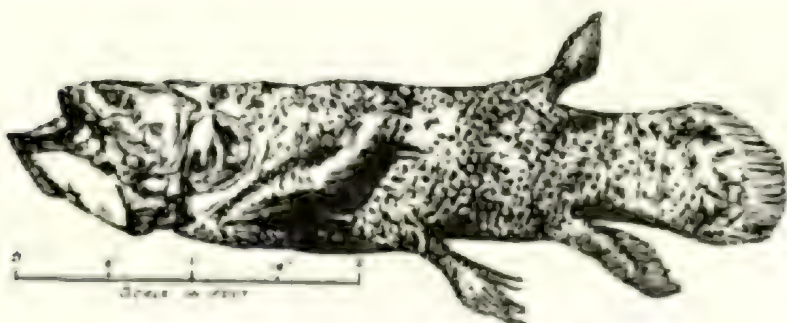
Post-Newer Volcanic Gravels, Sands, Clays and Alluvium: Gravels and sands along the west edge of the Werribee Plain sunkland form the Rowsley Fault Apron. Alluvium has been deposited along the courses of the Werribee and Parwan, above the Rowsley Scarp, below which the streams are cutting through the basalt; whereas, above the fault-line, they have long since cut through the hard basalt cap and into softer underlying rocks, enabling them to reach grade and to deposit alluvium along their valleys.

Below the Fault Scarp, loosely compacted recent alluvium is found in the fertile and extensive Bacchus Marsh flats.

"THE SECOND COELACANTH"

By J. H. WILLIS

Early in 1939 ichthyologists the world over—and many naturalists of catholic taste—were amazed by the announcement that a kind of fish, believed extinct since Cretaceous times, had suddenly appeared off the coast of South Africa near East London; it was almost as if some dinosaur had come to life again! The solitary specimen trawled was five feet long, weight 127 lbs., and became the type of a new genus and family, *Latimeria* in the *Latimeriidae*—closely related to the fossil *Coelacanthidae* which were ganoid fish having deeply imbricated cycloid scales and large jugular plates [see *Nature*, 143: 455-6 (March 18, 1939)]



Malania anjouanac J. L. B. Smith (Family *Latimeriidae*)
A new genus and species of *Coelacanth*.

After *Nature*, 171: 100 (Jan. 17, 1953), by permission Professor J. L. B. Smith.

So momentous was the discovery that Professor J. L. B. Smith (ichthyologist at Rhodes University, Grahamstown) prepared a leaflet in English, French and Portuguese, describing the new coelacanth and offering a reward of £100 for each of the first two additional specimens caught. These leaflets were circulated among native fisherfolk throughout the coastal regions of the Western Indian Ocean. Nothing transpired for 14 years, and then, as a direct result of Professor Smith's enthusiasm, on December 20th last a native on the Island of Anjouan (Comoro Archipelago) hooked the second coelacanth from a bottom of eight fathoms, 200 yards or more offshore. This fish came to the village market next day and was saved from being cut up by another native who recognized its likeness to the picture in Smith's leaflet; it was a male, with total length of 4 ft. 7 in.

Anjouan inhabitants know the coelacanth well and maintain that one or two are caught every year in the same waters. Now that the search for these "living fossils" has been focussed on a definite locality, it must only be a matter of time before other and undamaged examples, perhaps of several species, will be obtained for investigation. Professor Smith establishes a new genus *Malania* (after Dr. D. F. Malan, Prime Minister of South Africa) for the second coelacanth, giving a most informative account of its discovery and salient features in *Nature*, 171: 99-101 (Jan. 17, 1953). I am indebted to Professor Smith for kind permission to reproduce a drawing of his illustration in *Nature*, and to Miss Coryl Skewes who made the accompanying very beautiful sketch.

THE SEA-EAGLES OF MALLACOOTA

By F. J. BUCKLAND, "Sunny Corner", Mallacoota

[The nomination of the writer of this story for membership of the Club will be before the General Meeting on July 13. During his long association with the Mallacoota lakes, while residing on their shores, Mr. Buckland has had excellent opportunity to observe Nature in secluded places.—Editor.]

There are two pairs of White-breasted Sea-Eagles always to be seen about the Mallacoota lakes. One pair nests in a tall "White Gum" on the shore of the upper lake, and the second pair have a nest in a big stringy-bark tree close to the edge of the lower lake. The latter nest has been in use each season for over fifty years, the young eagles apparently leaving the district as soon as they are fully fledged. These eagles feed mostly on fish and smaller birds, and they kill and eat a number of young Silver Gulls each year in the gull rookery on the Goodwin Sands. Recently I had the opportunity to observe the Sea-Eagle's ability, under favourable conditions, to "take off" from the water, and also a method it has of getting out of difficulties in less favourable circumstances.

The first time I saw one of these birds actually in the water was at the mouth of Harrison's Creek. It swooped at a pair of Chestnut Teal which had been disturbed by my launch. The Teal "crash-landed" on the water, and promptly dived. The eagle apparently miscalculated its speed and it also hit the water in a patch of thick submerged water-weed. It did not attempt to rise off the water but fanned its tail very wide and raised it in the air above its back. The wind was quite strong at the time and the eagle simply sailed to the shore some thirty yards away, walked out on a dead tea-tree branch, and took to the air.

The second incident occurred some months later. I was motoring along the foreshore road at Mallacoota, and disturbed a Sea-Eagle which had been eating a Coot. It flew along in front of the car for a few hundred yards, with portion of the Coot clutched firmly in its talons. As we approached Stingray Point, a second Sea-Eagle flew off a tree and attacked the first one. They flew out over the water and, after several clashes in the air, the bird with the Coot was knocked down into the water. It disappeared from sight, and when it came to the surface, minus the Coot, it appeared feet first. However, it soon righted itself and remained stationary for a few seconds, floating very high on the water. I fully expected to see another demonstration of sailing, but to my great surprise the eagle raised its wings clear of the water and literally "exploded" into the air, just as a Black Duck does when suddenly disturbed. Apparently it was the dense growth of water weed that prevented the first one from taking off from the water.

The third story concerns the Sea-Eagle's taste for young birds. I once saw one attack a pair of Black Swans and their brood of cygnets, when I was fishing from my launch in a secluded part of the lower lake at Mallacoota. There were a number of swans on the lake, and one pair with five or six cygnets was several hundred yards away from the main flock. They were swimming along, with the cygnets following close behind the mother bird. The youngsters were small and looked for all the world like a number of golden powder-puffs being drawn along in the wake of the old bird as she swam.

Our friend the Sea-Eagle had been watching them too, from his perch on the dead limb of a high tree nearly half a mile away. Having made up his mind to attack, he glided down to within a few feet of the water and bore down on the little family group. When the eagle was about fifty yards away, the male swan uttered several loud warlike trumpet-calls and turned to face the oncoming enemy. The mother bird remained a few yards in the rear of her mate, also facing towards the danger.

As the eagle came in close, the guardian of the brood rose half out of the water and struck at him, first with the right wing and then with the left. Had either connected, the old pirate would probably have had a ducking, or worse. The attack was renewed several times, accompanied by loud screams from the eagle and much trumpeting from the swan. However, each time there was such determined resistance that the eagle finally gave it up and flew slowly back to his perch, no doubt to watch for something not so well guarded.

While the fight had been in progress I had not seen the cygnets, and as there was still no sign of them I cruised slowly towards the two old birds. Approaching to within good observing distance, I noticed that the mother bird had her wings held slightly away from her body, and on drawing still closer I saw the whole brood suddenly appear from under her wings where they had taken refuge during the battle.

THE VICTORIAN NATIONAL PARKS ASSOCIATION PUBLIC MEETING

Members of the Club are reminded of the public meeting to be held in the Melbourne Town Hall on Thursday evening, July 23rd. The Lord Mayor (Cn. W. Breas) is to act as Chairman, and short addresses will be given by the Minister of Lands and Conservation (the Hon. R. W. Holt, M.L.A.) and the President of the Association (Mr. Crosbie Morrison). The rest of the evening will be devoted to the screening of films dealing with Australian and overseas national parks.

The meeting is being organized to extend the interest of the public in their parks. Also it should result in a substantial increase in membership of the Association, without which the achievement of immediate objectives is likely to be exasperatingly slow. Furthermore, the implied moral support of a very great membership is necessary for the future success of the Association's campaigns.

The Victorian National Parks Association developed from and succeeded the National Parks and National Monuments Standing Committee, in the affairs of which the F.N.C.V. played a leading part. The component organizations, formerly loosely united by correspondence and periodical conferences, are now organized as a closely co-operating unit with a formal constitution and properly defined rights of representation. All the important Victorian natural history societies, walking clubs, youth organizations and other societies interested in conservation and nature protection are joined as Corporate Members. For the private member the annual subscription is a nominal five shillings, and half of that sum for those under sixteen.

Even in its formative stage the Association, backed by the prestige built up by the Standing Committee, exerted considerable influence in shaping the National Parks Bill introduced late in 1952 by the then Minister of Lands (Sir A. E. Lind). It is the task of the Association to see that the present government introduces a new Bill—one which will avoid the all-too-evident faults and shortcomings of the 1952 Bill.

The objects of the Association, laid down in the Constitution, are themselves a good indication of the policy it will pursue:

- (1) To strive for the welfare of National Parks and their preservation in perpetuity.
- (2) To foster public interest in and appreciation of National Parks.
- (3) To form a link between the public and the Administration in matters concerning National Parks and to advise, when required, the appropriate authority.
- (4) To make investigations and representations for further reservations of National Parks.
- (5) To co-operate with persons or organizations having similar objects or like interests.

—J. ROSE GARNETT.

DONALD MACDONALD SANCTUARY

By A. E. BROOKS

The last large area of Beaumaris heathland, where Donald MacDonald must often have roamed admiring the many species of birds and native flowers of the red-sand area, has been subdivided into building allotments. Houses are already being erected on land where many orchids grew, but separated from this area by only the width of a roadway is the noted naturalist's memorial reserve, where native birds and plants will always be protected. There is also a monument to Donald MacDonald and, although the reserve has been neglected for some time, it is hoped that many improvements will soon be effected.

As some of our members, when visiting Black Rock, have failed to locate Donald MacDonald Park, a few words concerning its location may not be out of place. This memorial park is situated in Hayden's Road on the corner of Fourth Street. It could be reached by travelling along Beach Road beyond the Black Rock train terminus to Fourth Street, then along the latter street for about half a mile until a football ground is seen labelled Donald MacDonald Recreation Park. The enclosed part of the park adjoins this on the east side.

Facing Hayden's Road is a memorial fountain and a plaque with a likeness of Donald MacDonald and the inscription:

Donald MacDonald, Friend of the Creatures of the Wild, chose this District in which to live and to end his days. Born at Fitzroy 1857, died at Black Rock 1932. Erected by readers of his Nature Notes in the *Argus*.

The enclosed area of about two acres is covered with coastal tea-tree (*Leptospermum laevigatum*) to the almost total exclusion of everything else. Much wire netting has been removed from the enclosing fence, but birds seem to appreciate the bird bath and fountain, which are more substantially enclosed. The difficulty in finding this park is due to the wide belt of thick tea-tree which separates it from the roadway.

Extracts from the Sandringham City Council's Scrap Book show that representatives of the Council, Natural History Societies, and other interested organizations, held a meeting early in 1938 and appointed an executive committee to discuss matters relating to the provision of a suitable memorial to the late Donald MacDonald. This consisted of Mrs. Britomarte James, Miss Campbell, Dr. Garnet Leary, Messrs. A. H. Mattingley, R. H. Croil, J. W. O'Neill, H. Beck, Ernest McCaughan, and Crosbie Morrison who acted as honorary secretary.

On Sunday, December 17, 1939, the memorial in the form of a bird bath in sculptured stone, surmounted by a dancing brolga and bearing a bronze bas-relief portrait of Mr. MacDonald, was unveiled by Mr. MacDonald's daughter, Mrs. Elsie Whittle. The sculptor was Mr. Stanley Hammond.

Among those present at the unveiling ceremony were Sir Edward Cunningham, Sir Harry Lawson, two of Mr. MacDonald's nieces, Miss Kathleen MacDonald and Mrs. Margaret Fletcher, and representatives of the F.N.C.V., the Bird Observers' Club, the Gould League of Bird Lovers, the R.A.O.C., the Wattle League, the Centenary Club, the Historical Society, and the Entomological Society. A floral tribute was placed on the memorial by Miss Cullinane, one of the oldest residents of Black Rock.

In 1952 the F.N.C.V. Council appointed a committee, consisting of Miss M. L. Wigan, Mr. N. A. Wakefield and the writer, to assist the Sandringham City Council in connection with the care and development of Donald MacDonald Park. The Sandringham City Council immediately showed its appreciation of this interest by replacing wire-netting missing from the fence and clearing for a few feet inside the entire fence-line.

The Committee's plan for preliminary work, submitted to the Council and approved by it, includes the following recommendations:—

1. Further repair of the fence to make it rabbit-proof.
2. The gates to be repaired and kept locked for the time being, one key to be retained by the F.N.C.V. Committee.
3. Two notices to be placed at the front and rear of the enclosure with the wording "Bushland Sanctuary. Preserve Your Birds and Plants".
4. Alien trees and shrubs to be removed and an area of about one square chain cleared for the establishment of attractive local trees and shrubs.
5. The approach from Hayden's Road to the memorial to be cleared, except for two ornamental trees previously established there, and an avenue of Australian trees planted.

It is proposed to eventually form a committee of management, arouse general local interest, organize excursions for seed-planting and the transfer of local plants into the sanctuary, and to institute further improvements.

There has been some criticism of these plans for the future of MacDonald Sanctuary, but the spontaneity with which seedlings are appearing in the cleared strip inside the boundary fence indicates that when a new part of the area is cleared many species will regenerate even without replanting. At the time of writing there are many Tiny Greenhoods in flower within the sanctuary, and a census has revealed that there are already no fewer than twenty-four native species growing near the fence. This is interesting in view of a first impression that the sanctuary contains only Tea-tree and Wattle.

Doubts about the success of transferring heathland plants into the sanctuary should be dispelled when it is considered how some of our members have successfully moved such into their gardens from areas about to be cleared. This is not difficult to achieve if plants of the right size are selected, dug carefully and transferred into a similar habitat. These conditions will not be difficult to fulfil in the MacDonald Sanctuary.

The plants within the two-acre reserve include Hill Sword-sage, Tassel Rope-rush and Giant Rush; the lily family is represented by Spreading Flax-lily, the irises by the Long Purple-flag, and the orchids by the Tiny Greenhood, Fringed Spider-orchid, one or two Sun-orchid species and an unidentified Greenhood. The Angular Noon-flower and Downy Dodder-laurel are represented, legumes include the abundant Coast Wattle, the Showy Bossiaea and the Heathy Parrot-pea, and of the spurge family there are the showy Wedding Bush and the Broom Spurge. There are two species



Photo: K. Glance

The Memorial Fountain

of *Hibbertia*, the Bundled and the Silky Guinea-flowers, and the myrtle family is represented by the prominent Coast Tea-tree. Cranberry Heath and Prickly Broom-heath have appeared plentifully, and there are a few plants of Common Heath and Common Beard-heath. The Kangaroo Apple is there, too.

Many of these plants have appeared during the past several months, and it will be interesting to see the number which are sure to grow after the proposed thinning of the dense tea-tree growth within the sanctuary. The fountain is a favoured drinking and bathing place for quite a number of birds. Yellow Robins, Fantails, Silver-eyes, Thornbills, as well as the introduced Blackbird, visit it frequently; and with the restoration of the heathlands flora, more birds will come. So, with very little actual work, this two-acre reserve can be restored to a bird and plant sanctuary fitting as the memorial to a great naturalist.

REVIEW: "DANGEROUS SNAKES OF AUSTRALIA"

This new book, from the pen of Eric Worrell, is the most recent addition to the literature on a subject of universal, even if somewhat reluctant, interest. Wait's *Reptiles and Amphibians of South Australia* (a Science Guild Handbook of 1929, and now practically unobtainable) was restricted in its field. So, too, was Glauert's *Handbook of the Snakes of Western Australia* (West. Aust. Nats. Club—1950, and still available). Kinghorn's comprehensive pocket-size compendium *Snakes of Australia* of 1929 is now unobtainable. R. A. Hunt's short *Key to the Identification of Australian Snakes* (F.N.C.V.—1947), still available from the Club Librarian, could well be used in conjunction with the new book.

Mr. Worrell's book, *Dangerous Snakes of Australia*, is partly based on his own field observations and experiences. He has compressed into 64 pages snake-lore that has accumulated over the years, and the average "Bushman, Bush-walker, Missioner, Serviceman, Boy Scout, New Australian and Naturalist" for whom it is written, will find it a reasonably reliable *vade mecum* during excursions into snake country. It is small enough for pocket or haversack, but the paper, though suitable for the numerous clear informative illustrations, is not good for out-of-doors in all climates. The rather obscure subdivision into sections (or chapters?) emphasizes the lack of an index for quick reference.

Twenty-four pages are devoted to the biology of snake venoms, the preparation and use of anti-venine and the emergency treatment of snake-bite. This tends to establish a profound respect for the Australian representatives of the Ophidia, but there is the reassuring reference to the 1 in 1,600,000 chance of an Australian succumbing to snake-bite. The rest of the book contains succinct descriptions of the reputedly dangerous species, with notes appended for those who, by chance or choice, dabble with these. The tedious trinomial classification is used throughout, a nomenclatural refinement hardly necessary in a popular book. The usual importance is attached to scalation, but colour and climatic and geographical ranges are also noted, though a few diagnostic points are omitted for the sake of brevity. The western species are not adequately surveyed, but Glauert's *Handbook* fills that need. Distribution notes are at times misleading—the Death Adder does not occur in "coastal hills and valleys" in Victoria, nor is the Copperhead there restricted to "swampy mountains".

However, the book should fulfil its purpose, and it is recommended for an even wider selection of readers than that mentioned by the author. It is published by Angus and Robertson, Sydney, and priced at 10/6.

—J. ROS GARNET.

CLUB EXCURSION TO MENZIES CREEK, CLEMATIS

The weather on Sunday, May 17, treated the 16 or so members very kindly on their fungi excursion to Menzies Creek; and considering the long spell without rain the number of specimens seen was surprising.

First in discovery and certainly foremost in interest were the specimens of the Vegetable Caterpillar, *Cordyceps gummi*, several of which were dug out entire. Examples of this are always to be found along that stretch of the creek at this season. Then members were delighted by those dainty little fan-shaped "hoods", *Xerotus archeri*, growing on a decaying branch. *Flammula eccentrica* and *Sclerophyllum commune* were two others of the "bracket" type of agarics noted.

As could be expected for the district, *Lepiota gracilenta*, the Parasol fungus, and *L. cristata* were in evidence, as was also the Rooting Shank *Collybia radicata*. Surprisingly enough, only one small group each of two *Myceena* species were encountered all day. One was *Myceena pullata*, with its long slender stems with fluffy bases, and the other species was not identified. *Myceena subgalerioides*, usually well in evidence, was not seen this time. To round off the agarics, there were *Psathyrella disseminata*, that world infamous *Armillaria mellea* which does so much damage to standing trees, the equally ubiquitous *Laccaria laccata* (not infamous), and the uncommon *Clitocybe cyathiformis* var. *cinereascens*. Other fungi, *Ganoderma applanatum* (at least two feet across at the widest part), two species of *Botrytus*, and the red-staining *Polyporus rudis*, completed our list.

At the billy boiling rendezvous, the party was entertained by a "tame" wild Kookaburra, which approached to within arm's length of some members while selecting the choicest tit-bits thrown to it; and two of the members who went further along the creek saw a colony of Bell-birds.

—R. D. LEE.

HAWTHORN JUNIOR F.N.C. EXCURSION TO MT. ELIZA

On November 1, last year, about 30 members of the Hawthorn Junior Club held a half-day excursion. Conveyed by the popular Fisch truck and private cars, they were led by Mr. Yorston (father of one of the members) to some acres of husband owned by him, about 1½ miles south-east of the Mt. Eliza general store.

At about 450 feet above sea level the formation is of sandstone and mudstones of Ordovician age; while the mount itself, 530 feet high, is granodiorite of a later age, it having pushed through the sedimentary rocks.

In the left distance could be seen Western Port Bay; while below spread the Moorooduc Plain, composed of Tertiary sediments, and very swampy in places. The Moorooduc quarry with its folded rocks was seen from the edges during the walk about the area, and graptolites could have been obtained by access to the quarry.

The area is well covered with eucalypts and bushy vegetation, but the flowers, orchids and birds attracted most attention. Koalas and wallabies have been seen at times, but on this occasion they were absent.

Christine Fisch rendered the following list of orchids for the day: Fringed Spider Orchid, Musky Caladenia, Brown-Beards, Nodding and Tall Greenhoods, Maroonhood, Blunt and Tiny Greenhoods, Common Onion Orchid, Large Waxlip, Twisted Sun Orchid, Dotted and Slender Sun Orchids and Hare Orchid.

Peter Willis lists the birds spotted during the excursion: White-throated Tree-Creeper, Yellow-tailed Thornbill, Welcome Swallow, Blue Wren, Yellow Robin, Red Wattle-Bird, Grey Thrush, Grey Fantail, Willie Wagtail, Australian Raven, Magpie-Lark, White-backed Magpie, White-eared and White-plumed Honeyeaters, Kookaburra, and Pallid Cuckoo, as well as the introduced Blackbird, Sparrow, Thrush, Goldfinch, Starling and Myna.

PICTORIAL BIOLOGY OF A LEAF-CUTTER BEE

Megachile chrysopyga Smith

By TAKLTON RAYMENT, F.R.S.

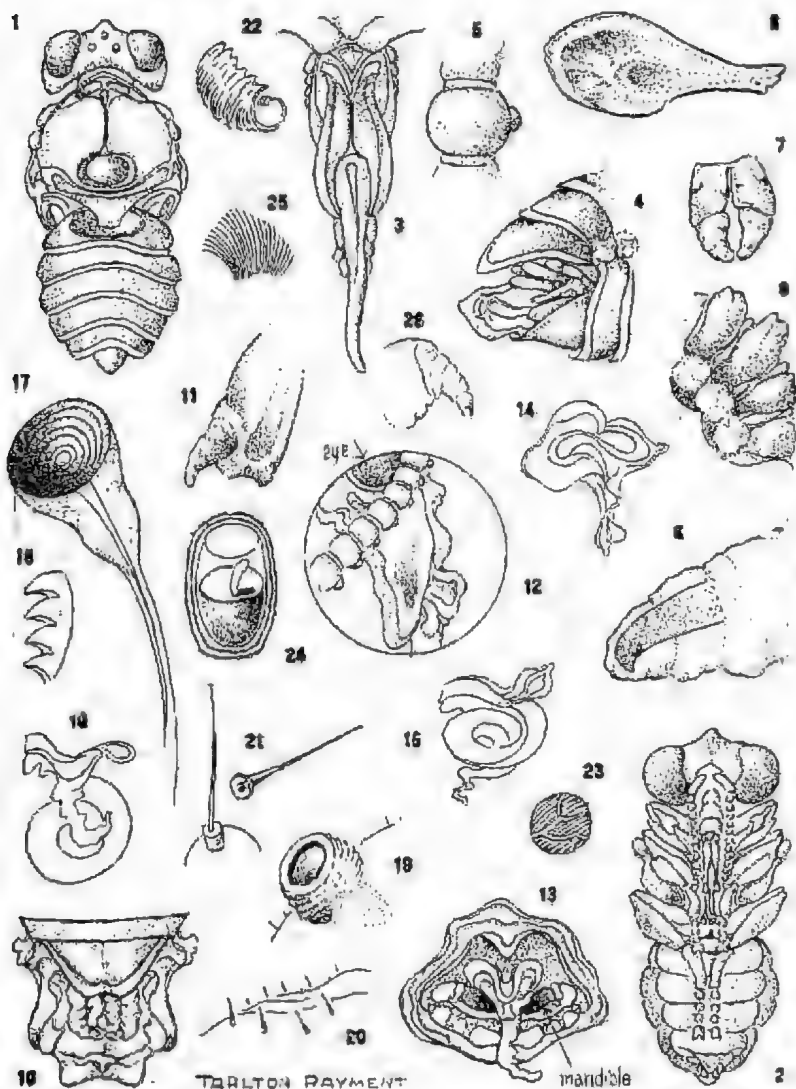
The genus *Megachile* contains two groups, the one pinking leaves and the other modelling in resin and wax. Moreover, in the first group the abdomen is shovel-shaped, as in *M. chrysopyga* Sm. while in the second it is longer and parallel-sided, as in *M. philipensis* Raym. The famous French naturalist, Jean Henri Fabre, regretted that bees were not classified according to their trade rather than their uniform. This concept is evidently shared by Prof. T. D. A. Cockerell, who has placed those species that model in wax and resin in his new subgenus *Hackeriapis*.

Hymenopterists agree that bees evolved from wasps, and, after making thousands of dissections, the author concludes that there can be no other verdict. The evidence afforded by body-structure is supported by a study of the insects' habits. The leaf-cutting bees are proficient in the art of pinking or cutting leaves, and are able to measure sizes accurately so as to produce truly artistic work. Size is not determined mechanically, for dimensions vary according to circumstances.

I was delighted to discover one wasp, the graceful red and black *Discoelius ecclesiasticus* Raym., certainly of the Odyneri, the mud-dauber family, yet departing from her traditional trade to pink the trifoliate leaves of the "Running Postman", *Kennedyo prostrata*. Admittedly, she lacks the artistry of the leaf-cutting bees, for there are no circles and true ellipses, but only ragged pieces slashed out haphazardly. These are then chewed into a fine vegetable putty and used in the forming of cell-divisions. This is crude work perhaps, but it should be noted that many members of *Megachile* still plaster a wad of similar "putty" to seal the door of their home.

The accompanying set of illustrations shows the interesting biology of *Megachile chrysopyga*, a true leaf-cutter bee. The story told by these pictures is as follows:

1—Dorsal view of female pupa before shedding the fifth or final pellicle on Feb. 23, 1953. 2—Ventral view; the compound eyes are beginning to colour purple. 3—The development of the mouth-parts; note the long glossa. 4—Lateral view of the invagination of the apical segments of the female abdomen. 5—Each of the segments of the flagellum has a large tubercle. 6—Through the wing-pad of the pupa may be seen the developing nervures inside. 7—The fifth tarsal segment shows the first signs of bifurcation. 8—Lateral view of some of the ridged segments of the fully-developed larva showing the tubercles before the fourth pellicle was cast on Jan. 20, 1953. 9—The amber chitinous claw was visible through the fifth pellicle on Feb. 14, 1953. 10—Dorsal view of the invagination of the abdomen of the female showing the two embryonic gonostyli. 11—Posterior tibia showing the developing calcar; the strigilis of the anterior leg is very similar at this stage. 12—Lateral view of the mouth-parts; the mandible was being gradually chitinized inside the skin. 13—Looking into the cast pellicle (the fourth) from the front; the dark larval mandibles were attached to the pellicle. 14, 15 & 16—Even the dry pellicle is not without beauty. 17—Portion of a long tracheal tube was shed with the pellicle; interior of the spiracle. 18—There are about four lines of serrations inside the mouth of the spiracle. 19—Exterior of one of the spiracles cast off with the fourth pellicle on Jan. 20, 1953. 20—All the hairs of the larva are attached to the dry pellicle. 21—Two of the hairs more highly magnified; they are sensory in function, with a nerve along the centre. 22—Several elliptical pieces of leaf were used to build the walls of the cells. 23—Four or five circular pieces form



the divisions between the cells. 24—Graphic section of a cell with the pollen-pudding and an egg, on approx. Feb. 1, 1952. 25—There were two tufts of appressed hair on the scutellum, under the fifth pellicle. 26—Elements of a spur on the posterior coxa; the coxae in *Megachile* are often spined. The bees emerged from their cells on the morning of February 26, 1953, therefore, 391 days are required by this species for complete development from egg to imago.

NOTES ON THE RED-BACK SPIDER

(Latrodectus hasseltii)

By J. ROS GARNET

Carnivore versus Vegetarian

I undertake my annual clean-up of Red-back Spiders in the autumn. They are more easily detected then, when the female has finished egg-laying and the brownish spherical egg-sacs cluster conspicuously, if rather untidily, in the equally untidy webs. Last autumn, one of the two webs located, near ground level in the fernery, contained no less than ten egg-sacs presided over by a particularly large female. Despite the prodigious output of eggs, the spider was still well nourished, her abdomen being between eight and nine millimetres in diameter.

She was put in a glass jar to be preserved as a museum specimen and I dropped a black cricket in too; but the presence of the latter only caused the spider to remove herself as far from it as possible. Occasionally the cricket would stumble over the spider or get its antennae mixed up with her legs, but there was no display of aggressiveness on either side. The cricket's antennae vibrated in what was construed to be agitation, but that was all. So I left them to their own devices.

Taking a glance at the jar some six hours later, expecting to see the spider enjoying a repast of cricket-juice (for they *do* feed on crickets), I was astonished to see the cricket feeding on the spider! There was my intimated museum specimen utterly ruined with the cricket industriously chewing away at the upper surface of her cephalothorax. It did not at any time attempt to nibble the abdomen or legs. How much longer it worked on the dead spider I do not know, but the latter looked much the same next morning.

The cricket, however, was now moving around the jar minus one leg. Thinking this due to excessive humidity I removed the lid and at once noticed an offensive ammoniacal odour, strongly reminiscent of the methylated amines—the substances associated with stale fish. Whatever caused the odour must have been severe for, as the day wore on, most of the cricket's antennae and legs dropped off and it finally died. Perhaps the odour originated in the cricket and served to stupefy the spider. Or was the cricket's dismemberment caused by its ingestion of the juices from the spider's cephalothorax?

Odours emitted by some insects certainly do have an anaesthetic, even lethal, effect on others, as testified by entomologists who happen to mix certain live insects in clean collecting bottles. This phenomenon was strikingly demonstrated recently when a tiny arachnid of some sort (it was not a spider) was kept in a stoppered bottle for some time. Later, it was given a small green dipterous insect to assuage its hunger. The fly took a few steps along the inner wall of the container and immediately collapsed, apparently overcome by a noxious vapour. It did not recover and the small arachnid was soon eating it.

There, then, is the account of the redoubtable Red-back falling victim to a common field cricket. The circumstances were artificial; and I suspect that, had the cricket stumbled across the spider on her home ground, it would hardly have survived the snare of the tough, sticky and untidy web.

"David and Goliath"

That it is not always the bigger who vanquishes is apparent to most nature observers. Concurrently with the field cricket episode, another little tragedy was being enacted. Several hundred newly-emerged spiderlings, swarming prior to dispersal, were sprayed with D.D.T.—gammexane mixture; but two survivors of earlier broods were collected and put together in a jar.

I might remark that some thousand or so spiderlings had already dispersed from seven of the egg-sacs collected, for these exhibited the little cleanly-cut emergence holes at the summit. (For comments on the fecundity of the Red-back Spider, see my notes in *Vic. Nat.* 68: 17, May, 1921.)

To return to the jar: One of the specimens had been through several moults or else was a very small male and the red stripe was evident on its three millimetre diameter abdomen. The other was only about two-thirds that size, and still retained the white and black pattern of the youngster of the species.

I am well aware that spiderlings will devour one another, but had believed that bigger ones would have the advantage by virtue of their longer legs. But in no time the little spider had its mate properly tied up, and it was not long before the bigger one began to shrink while the other became correspondingly inflated.

Since the pair were suspended somewhere in the middle of the bottle, I was reminded of the practice of aircraft refuelling in mid-air.

PRESERVATION OF NATIVE FLORA

By J. S. SEATON

Australia has been endowed with one of the richest floras in the world, yet her white possessors have done less toward its preservation than people in most other lands. If such a heritage is to be preserved for posterity, we must be prepared to benefit from the experience of these other countries and use all the methods of preservation.

It is interesting to compare the Commonwealth with South Africa, which has had some three centuries of European occupation. The indigenous flora of the Cape Province bears a striking resemblance to our own; but, while the plant life of the former region has certainly suffered over the years, an even greater extermination of species would have occurred had it not been for the excellent work carried out by the Kirstenbosch Botanic Gardens since 1913. When one of the most beautiful flowers in Cape Colony, viz. the "Blushing Bride" (*Serruria florida*), was on the verge of extinction, a few plants were raised from seed and the progeny eventually distributed to many parts of the world; it is now successfully grown, when the appropriate methods are employed. The New Zealand "Glory Pea" (*Clanthus panicus*) would doubtless have died out long ago, had the Maoris (and later white colonists) not brought it into cultivation—the plant is extremely rare in the wild state.

The relationship of plants to insects, fungi and other organisms which prey upon them (predators and parasites) is all but completely unknown in Australia. It is this complex pattern of life which constitutes the "balance of nature"—key to successful preservation. There is a need for close study regarding the soil requirements of Australian plants, the time when seedlings normally germinate, the proportion of survivals, their span of life, and many other features which would prove an insurance against loss. While preservation in an undisturbed and natural habitat must be the main objective, there is no guarantee that many of these peculiar habitats will be safe for all time; so, the fact remains that cultivation may be the best way of saving certain species from extinction. In Victoria there seems to be an over-emphasis on "nature" preservation, to the exclusion of all other means. I believe a broader outlook, embracing the cultivation of many more native flowers, should be adopted.

A NEW SPECIES OF CHILOGLOTTIS (ORCHIDACEAE)

By the Rev. H. M. R. Rupp, Willoughby, N.S.W.

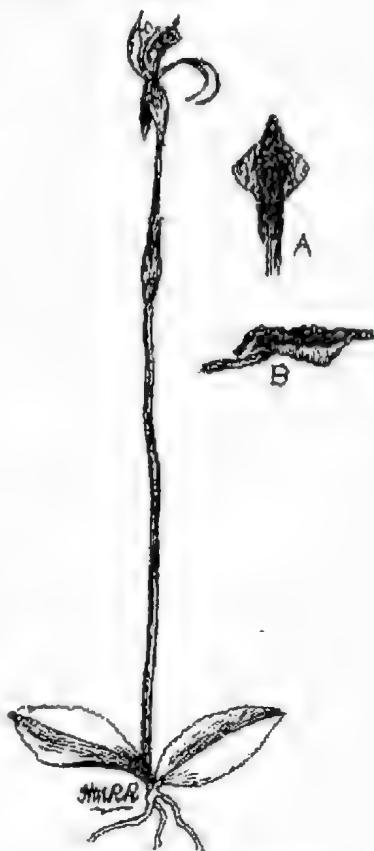
CHILOGLOTTIS DOCKRILLII sp. nov.

Planta terrestris usque ad 18 cm. alta. Caulis ruber, paulum robustior quam ut solet. Bractea, aliquanto magna, laxè vaginata. Folia 2 ad caulis basin, fere sessilia, ovata sed mucronata, ca. 25 mm. longa. Flos solitarius, fuscus ruber. Sepalum dorsale post columnam curvum, 12 mm. longum, anguste lanceolatum, et ad basin cuneatum. Sepala lateralia 1 cm. longa, anguste lanceolata, 4 mm. lata. Petala angustissime linearia, recurva, 15-16 mm. longa. Labellum unguiculatum, prope 1 cm. longum; discus rhomboideus, 4 mm. longus, callo glanduloso magno; glandes magni duo ad basin protrudentes; callus anteriore discum excedens, obtuse acuminatis. Columna flexa, ca. 1 cm. longa, supra angustissime alata.

Holotype: Barrington Tops, N.S.W.; February 1953; A. W. Dockrill (in Herb. N.S.W.).

A terrestrial plant up to 18 cm. high. Stem reddish, rather more robust than is usual in the genus. Bract rather large, loosely sheathing more than half-way up the stem. Leaves 2, basal, almost sessile, ovate but very shortly mucronate, about 25 mm. long, margins somewhat crisped. Flower solitary, red-brown. Dorsal sepal curved closely behind the column, 12 mm. long, narrowly lanceolate towards the apex, cuneate below. Lateral sepals 1 cm. long, about 4 mm. wide, narrowly lanceolate. Petals very narrowly linear, almost filiform, recurved, 15-16 mm. long. Labellum on a rather long claw, with the claw almost 1 cm. long; disc rhomboid, 4 mm. long, with a large glandular callus; 2 large glands protruding slightly downwards at the base, other glands very small, but the callus in front narrowing to a blunt point well exceeding the margin of the disc. Column bent, about 1 cm. long, very narrowly winged above.

The outstanding distinctions of this species are the unusually tall flowering stem and the peculiar details of the large labellar callus. As is well known, the stem in several other species of *Chiloglottis* is elongated after fertilization has been effected, presumably to give the seeds a better chance of dispersal by wind. But in the present instance the stem attains a height of 15 to 18 cm. before the flower is mature. The labellum is shaped



Chiloglottis dockrillii sp. nov.

A—Labellum, above (enlarged).

B—Labellum, side (enlarged)

rather like that of *C. trapeziformis* R. D. Fitzg., but the claw is longer and the calli are quite different. In *C. trapeziformis* the callus consists of a small group of glands concentrated at the base of the disc. In the new species it occupies the greater part of the surface of the disc; two rather large jointed glands protrude at the base, bent slightly downwards; the remainder of the callus consists of a mass of very small glands, which is produced beyond the front of the disc into an obtuse point.

Mr. Dockrill has done much valuable work for the National Herbarium of New South Wales in his searches for orchids, and I think it is fitting that this new species of *Chiloglottis* should be named in his honour.

SYSTEMATIC NOTES ON VICTORIAN MOSSES — 2

By J. H. WILLIS, National Herbarium of Victoria

SPHAGNUM

Last year I discussed [*Vict. Nat.* 69: 15-18 (June 1952)] the confusion and uncertainty which had so long obstructed the nomenclature of *Sphagnaceae* in Victoria, and an attempt was made to bring order out of prevailing chaos; four species (and probably a fifth) were recognized for the State. Since then, further research has demonstrated the need for name changes in two species, and again I am greatly indebted to Dr. A. Le Roy Andrews (Ithaca, U.S.A.) for critical reports on the identity of type material which he has been good enough to examine at my request.

Following are the names which must now be adopted for these two sphagna, with brief accounts of their unsatisfactory treatment in literature: also, for each Victorian species the proven synonymy is given (i.e. names which have been applied to Australian populations, but not the numerous synonyms which concern only New Zealand or other parts of the Southern Hemisphere):

S. CRISTATUM Hampe in *Linnaea* 38: 661 (1874)

Syntypes of this species—from Mt. Kosciuszko and "Mt. Aberdeen". i.e. Buffalo—are in the Melbourne Herbarium and are certainly identical. The latter collection is what Hampe had earlier labelled "*S. cymbifolioides* C.M." (in 1853), and is most probably the basis also of F. Mueller's *nomen nudum*, *S. cymbophyllum*, published in his *Second Systematic Index of the Plants of Victoria* (1854). Hampe was mistaken in calling F. Mueller's Mt. Buffalo collection *S. cymbifolioides*, for the type material of that species (in Mitten's Herbarium at New York Botanical Garden) came from Green Cape, south of Eden (N.S.W.), and represents, in the opinion of Dr. Andrews, merely a large form of *S. subacundum* Nees; the error was corrected by publication of *S. cristatum* in 1874.

C. Müller received several Australasian collections of *S. cristatum*, describing them each [*Flora* 1887] as different species, e.g. *S. leionotum* from New Zealand, *S. whiteleggii* and *S. wilsonii* from New South Wales.

C. Warnstorf [*Hedwigia* 29: 252 (1890)] made a serious mistake in reducing *S. cristatum* Hpe. to synonymy under *S. antarcticum* Mitt.—a very different plant in another section of the genus. Apparently he had not examined the true type (in fruit) of *S. cristatum*, because he cites the collection as from "Herb. Besch." (i.e. Bescherelle) and then says he had never seen fruit of *S. antarcticum*. Obviously the only reason for the reduction was Bescherelle's specimen, which could hardly have represented Hampe's *S. cristatum* from the Australian Alps. In his subsequent monograph, "*Sphagnologia Universalis*" (*Pflanzenreich*, Heft 51, Dec. 1911), Warnstorf still keeps *S. cristatum* as a synonym of *S. antarcticum* (p. 153), but has a contradictory note on pages 155-157:

Ein Originalprobe von *S. cristatum* Hpe. von "Humes (i.e. Hume) River", 1,220 m. u. d. M., (Australien) in Herb. Paris gehört nicht zur *Rigidum*—, sondern zur *Cymbifolium*-Gruppe.

So he had by then seen an authentic specimen of *S. cristatum*, recognized that it was not *S. antarcticum*, yet without amending the synonymy! W. W. Watts [Proc. Linn. Soc. N.S.W. 37: 384 (1912)] perpetuated this error.

To add to the confusion, Warnstorff (1911) so broadened his concept of the European species *S. subcolor* Hpe, as to include C. Muller's *S. leionotum* (N.Z.) and *S. whiteleggei* (N.S.W.) which are actually inseparable from the true *S. cristatum*; again, Watts "followed suit".

In 1908 (*Hedwigia*), Warnstorff had described two more species of sphagna in the INOPHLOEA section; both were from New South Wales, viz. *S. decipiens* and *S. wardellense*. Dr. A. Le Roy Andrews commented upon these, and the Mullerian entities mentioned above, in his 'Studies in the Warnstorff Sphagnum Herbarium VI The Subgenus Inophloea in the Eastern Hemisphere' [The Bryologist 54: 87-89 (June 1951)], as follows:

My tentative conclusion is that all these Australian and New Zealand "species" represent in reality a single one. If the species is distinct (i.e., from the European *S. palmatre* and *S. rubicolor*, etc.) as I have assumed it to be, the question of its proper name should be settled. Of *S. leionotum* there is an isotype in the herbarium of New York Botanical Garden which I have been permitted to study and would accordingly suggest that this name be employed.

Dr. Andrews was not to know that *S. cristatum* (banished by Warnstorff as a synonym in another subgenus) would be the legitimate name to adopt, antedating *S. leionotum* by 13 years, and without access to the type material (in both Melbourne and the British Museum herbaria) it would have been quite impossible to establish the real identity of Hampe's moss. Incidentally, the epithet "*cristatum*" is very appropriate, because this species may be recognized from a crest-like projection of exterior cells just behind the cucullate apices of its branch leaves.

S. AUSTRALE Mitten ex Wilson in *Flora Tasmania* 2: 162 (1858)

The situation here is far less complicated than with *S. cristatum* Hpe. Wilson published *S. australe* (type from Huon, Tasmania), using the manuscript diagnosis of Mitten, while the latter botanist's lengthy paper "Descriptions of some new species of Musci from New Zealand . . . etc." was waiting to appear in the *Journal of the Proceedings of the Linnean Society* [4: 64-100 (1860)]. When Mitten's work left the press, nearly two years after publication of the bryophyte section in *Flora Tasmania*, his diagnosis of *S. australe* was repeated word for word. *S. confertum* was described from western Tasmania and *S. antarcticum* from Campbell's Island (N.Z.). The types of these "species" (in Herb. Mitten, New York Botanical Garden) are conspecific, and clearly the name *S. australe* has priority of application. Warnstorff (1911) synonymised *S. australe* under *S. antarcticum*, believing that the *Flora Tasmania* had appeared wholly in 1860. Many botanists have made the same mistake; but reference to unbound copies of this superb work will show that it came out in ten parts between 1853 and 1860, the BRYOPHYTES being included in Part 8 (1858). In 1915 (*Hedwigia*), Warnstorff described another Tasmanian species, *S. roymouthii*, which must be added to the already considerable synonymy of *S. australe*.

VICTORIAN SPHAGNUM SPECIES

All synonyms known to have been used for Australian material, and of which the types have been investigated, are arranged alphabetically under the names now accepted, while a few presumptive (but not yet proven) synonyms are prefixed by a query (?).

MACROSPHAGNUM (RIGIDA) Group

1. *S. australe* Mill. ex Wils. in *Flora Tasman.* 2: 162 (1858)—Tas. type *S. antarcticum* Mitt. in *Jour. Proc. Linn. Soc.* 4: 100 (1860)—N.Z. type *S. confertum* Mitt. l.c. 100—Tas. type. *S. macrocephalum* Warnst. in *Hedwigia* 32: 7, T. 2, 16 (1893)—Tas. type. *S. roymouthii* Warnst. l.c. 57: 58, (1916)—Tas. type.

CUSPIDATA Group

2 **S. falcotulum* Besch. in *Bull. Soc. Bot. France* 67: (1885)—Fuegia type.

- S. bratherii* Warnst. in *Bot. Centralbl.* 82: 54 (1906)—N.S.W. type.
- S. cuspidatum* sens. Warnst. 1911, non Ehrh. 1791.
- S. depauperatum* Warnst. in *Bot. Centralbl.* 82: 55 (1906)—N.S.W. type.
- S. lanceifolium* C. M. & Warnst. in *Hedwigia* 36: 154 (1897)—N.S.W. type.
- S. naumanni* C. M. in *Engler Bot. Jahrb.* 5: 87 (1883)—O'land type.
- S. rodwayi* Warnst. ex Rodway in *Papers & Proc. Roy. Soc. Tas.* for 1913: 257 (1914)—Tas. type.
- S. scortechinii* C. M. ap. Warnst. in *Hedwigia* 36: 153 (1897)—O'land type.
- S. serratifolium* Warnst. in *Bot. Centralbl.* 82: 52 (1906)—N.S.W. type.
- S. serratum* Aust., var. *serrulatum* (Schlieph.) Warnst. sens. Warnst., non Schlieph. etc.
- S. serrulatum* Warnst. in *Hedwigia* 32: 1, T.1, f.1 (1893)—Tas. type.
- S. trichophyllum* Warnst. in *Hedwigia* 39: 100 (1900)—Tas. type.
- S. waitii* Warnst. in *Bot. Centralbl.* 76: 10 (1898)—N.S.W. type.

SUBSECUNDA Group

3. *S. subsecundum* Nees ap. Sturm. in *Fl. Germ. Crypt.* 2: Fasc. 17 (1819)—Europe type.

- S. commutatum* Warnst. in *Mogy. Bot. Lapok.* 1: 45 (1902)—N.S.W. type.
- S. comosum* C. M. in *Flora* 413 (1887)—N.S.W. type.
- S. cymbifoliosus* C. M. in *Bot. Zeit.* 9: 546 (1851)—N.S.W. type.
- S. dubiosum* Warnst. in *Hedwigia* 30: 20, T.1, f.7 (1891)—?Newfoundland type.
- S. laticornis* C. M. ex Warnst. in *Pflanzent. Heft.* 51: 312 (1911)—Vic. type.
- S. molliculum* Mitt. in *Journ. Proc. Linn. Soc.* 8: 99 (1860)—Tas. type.
- S. moorei* Warnst. in *Allgem. Bot. Zeitschr.* 1: 1 in *Kortenske No.* 11: 204 (1895) [+ var. *macrophyllum* Warnst. in *Pflanzent. Heft* 51: 169 (1911)]—Tas. type.
- S. nassmannianum* C. M. nomen nudum—Tas. type.
- S. novae-zelandicum* Mitt. in *Journ. Proc. Linn. Soc.* 8: 99 (1860)—N.Z. type.
- S. pseudorufescens* Warnst. in *Hedwigia*, 32: 6, T.2, f.5 (1893) [+ 4 vars. in *Pflanzent. Heft.* 51: 371 (1911)]—Tas. type.
- S. subventosum* Hampe in *Linnaea* 40: 301 (1876)—N.S.W. type.
- S. submyricinum* Warnst. in *Hedwigia* 36: 164 (1897)—Tas. type.
- S. sulcatum* C. M. ex Warnst. in *Pflanzent. Heft.* 51: 427 (1911)—Vic. type.

INOPILOEA Group

4 *S. cristatum* Hampe in *Linnaea* 38: 661 (1874)—N.S.W. & Vic. type.

- S. cymbifolium* sens. Auctt. Aust. & Warnst. 1911, non Ehrh. 1780.
- S. cymbophyllum* F. Muell. nomen nudum, 1854—Vic. type.
- S. decipiens* Warnst. in *Hedwigia* 47: 78 (1908)—N.S.W. type.
- S. leionotum* C. M. in *Flora* 408 (1887)—N.Z. type.
- S. magellanicum* sens. Paul 1924, non Brid. 1798.
- S. maximum* Warnst. in *Hedwigia* 30: 160 (1891)—Tas. & N.Z. type.
- S. medium* sens. Warnst. 1911, non Linn. 1831.
- S. medium* (sens. Warnst. 1911, non Linn. 1831).
- S. pachycladum* C. M. nomen nudum—?N.S.W. type.
- S. subcolor* sens. Warnst. 1911, non Hampe 1880.
- S. wardlawiae* Warnst. in *Hedwigia* 47: 81 (1908)—N.S.W. type.
- S. whiteleggei* C. M. in *Flora* 408 (1887)—N.S.W. type.
- S. wilcoxii* C. M. in *Flora* 407 (1887)—N.S.W. type.

5 *S. beccarii* Hampe in *Nouv. Giorn. Bot. Ital.* 4: 278 (1872)—Borneo type.

- S. grandifolium* Warnst. in *Bot. Centralbl.* 82: 33 (1906) [+ 2 vars. in *Pflanzent. Heft.* 51: 484 (1911)]—N.S.W. type.

*I saw this moss abundantly at Mt. Field West in the National Park, Tasmania, growing in and around shallow pools among communities of alpine cushion plants (at about 4,600 ft.); these Tasmanian examples varied in colour, robustness and branch density, showing nicely how by increased immersion the "fibrils" in the empty cells of the leaves may be partially eliminated. Dr. R. Melville recently collected at the Genoa Creek (far eastern Victoria) a suite of *S. subsecundum* quite remarkable for its diversity of colour and growth form—from dark green, very slender, sparingly branched and small leaved, to almost white, with robust congested branches and large leaves.

FLORA OF DIMBOOLA NATIONAL PARK

(A Comprehensive List of Species)

By E. T. Muir, Dimboola

Victoria's smallest National Park of 33 acres, adjoining the Dimboola High School, was officially declared and opened in November 1946. [See *Vict. Nat.* 62: 118 (Nov. 1945) and 63: 220 (Feb. 1947).] I promised then to prepare a census of all plants growing in this mallee reserve. Year by year, a few species have been added to the list which is now as nearly complete as it is possible for me to make it. Fungi and algae have not been taken into consideration (relatively few species of either group are present); but lichens, mosses and introduced weeds are listed, as well as the indigenous vascular species. No doubt occasional introductions will continue to appear from time to time, especially weeds of the families *Gramineae* and *Compositae* which spread so easily by wind-borne seed.

The list, here published, stands at 174 species of indigenous vascular plants (representing 52 families and 120 genera), 46 naturalised aliens, 18 bryophytes and 15 lichens. Families with the largest number of native representatives are *Compositae* (34) and *Gramineae* (16); these are well-fitted for survival in the semi-arid environment which obtains in this area. *Chenopodiaceae* are conspicuous (7 species) and there are 12 orchids; but the characteristic Australian families of *Proteaceae*, *Epacridaceae* and *Stylidiaceae* have each only a single member in the Dimboola park. Canopy is provided by the dominant mallee, *Eucalyptus dumosa*. Many kinds of plants are to be found only on the outer fringe of the reserve, where there are no eucalypts, but others prefer the friendly cover of the mallees.

In compiling my list, I have enjoyed the utmost co-operation by the Director and staff of the National Herbarium, South Yarra; their help in determining and checking many specimens is gratefully acknowledged. Mr. Cliff Beaglehole of Gorae West visited the reserve in November 1949 and collected every kind of moss and lichen that could be seen; to his enthusiasm then, we owe the record of nearly all these cryptogamic species. Finally, I am indebted to those other observers who have recorded numerous minute and ephemeral plants by close application of the "hands and knees" technique.

The systematic arrangement of families follows the Engler and Prantl scheme as used by Ewart and recently by J. M. Black in his revised *Flora of South Australia*. Alien plants are prefixed by an asterisk (*), and the following three symbols (given after each name) denote the frequency with which vascular plants occur:

c. Abundant in most parts.

w. Widely scattered, but not plentiful.

r. Rare—only one or a few plants noted.

Except where stated specifically, all the lichens and mosses were growing on sandy earth.

SYSTEMATIC LIST

Lichens

DERMATOCARPACEAE

Dermatocarpon hepaticum

DIPLOSCHISTACEAE

Ureolaria scruposa

LECIDEACEAE

Lecidea crystallifera

Psora decipiens

CLADONIACEAE

Cladonia aggregata

C. verticillata

C. sp. ? (grey, crisped and *Parmelia*-like—systematic position uncertain)

PARMELIACEAE

Heterodea muelleri

Parmelia amphixantha

P. imitatrix

P. tinidota—bark and twigs

USNEACEAE

Ramalina inflata—dead twigs

Usnea barbata var. *hirta*—dead wood

Siphula coriacea

TELOSCHISTACEAE

Teloschites parietinus—bark and

dead twigs

T. cheysophthalmus—bark

Hepatics

REBOLLIACEAE

Fimbriaria conocephala

RICCIACEAE

Riccia sp.

Mosses**FISSIDENTACEAE***Fissidens vittatus***DICRANACEAE***Campylopus introflexus***POTTIACEAE***Tortella calycina**Tricostella papillata**Barbula torquata**B. lucimani**B. pseudopilifera**Pottia starkeana**Desmatodon convolutus**Aloina sulliviana***GIGASPERMACEAE***Gigaspermum repens***FUNARIACEAE***Funaria hygrometrica**F. gracilis***BRYACEAE***Bryum billardieri**B. campylotheceum***BARTRAMIACEAE***Bartramia stricta***Vascular Plants****PTERIDOPHYTA (Ferns)****OPHIOGLOSSACEAE***Ophioglossum colicaeum*—r.**ADIANTACEAE***Cheilanthes tenuifolia*—r.**GYMNOSPERMACEAE (Conifers)****CUPRESSACEAE***Callitris propinqua*—w.**ANGIOSPERMAE (Flowering Plants)****SCIEUCHEZERIACEAE***Triglochin calcitrapa*—r.**GRAMINEAE (Grasses)***Themeda australis*—r.*Neurachne alopecuroides*—c.*Panicum effusum*—r.**Phalaris minor*—r.*Arctida behriana**Stipa elegantissima*—c.*S. variabilis*—c.*S. scimitrata*—w.**Aira caryophylla*—c.**Avena sativa**Amphibromus neesii*—r.*Danthonia geniculata**D. setacea*—c.*D. nutroniana*—w.**Pentstemonis airides***Lamarkia aurea*—w.**Koeleria phloides* var. *azorensis***Avellania micheli*—w.*Eragrostis elongata*—r.**E. cilianensis*—w.*Distichlis distichophylla*—w.*Poa caespitosa*—w.**P. bulbosa*—w.**P. compressa*—r.**Vulpia bromoides*—c.**V. myuros*—w.**Bromus rubens*—w.**B. gussonei*—w.**Chloris truncata***Lolium multiflorum*—w.**Parapholis incurva*—r.**Agropyron scabrum*—w.**Hordeum murinum*—c.**CYPERACEAE (Sedges)***Scirpus antarcticus*—r.*Eleocharis acuta*—r.*Lepidosperma viscidum*—c.**JUNCACEAE (Rushes)***Juncus ? polyanthemus*—r.**J. capitatus*—w.**LILIACEAE***Lomandra effusa*—c.*L. micrantha*—c.*L. glauca*—r.*Burchardia umbellata*—w.*Anguillaria dioica*—c.*Bulbine bulbosa*—c.*Thysanotus patersonii* c.*Dichopogon strictus*—c.*Dianella revoluta*—c.**AMARYLLIDACEAE***Hypoxis glabella*—c.**Brodiaea uniflora*—c.**IRIDACEAE****Romulea cruciata***ORCHIDACEAE***Prasophyllum fusco-viride*—c.*Thelymitra aristata*—w.*Caladenia carnea*—c.*C. deformis*—r.*C. dilatata*—r.*C. filamentosa* var. *tentaculata*—s*Diuris maculata*—r.*Pterostylis robusta*—c.*P. mucica*—c.*P. cycnocephala*—r.*P. rufa*—r. (one specimen)*P. longifolia* r.**URTICACEAE****Urtica urens*—r.**PROTEACEAE***Grevillea liliifolia*—r.**SANTALACEAE***Santalum acuminatum*—r.**CHENOPODIACEAE***Rhagodia nutans*—w.*Chenopodium pseudonnicophyllum*—w.*Atriplex semibaccata*—c.*Bassia quinqueecuspis**B. uniflora*—c.*Kochia tomentosa*—w.*Enchylaena tomentosa*—c.**AMARANTHACEAE****Amaranthus albus*—r.**A. retroflexus*—r.*Trichium obovatum*—w.*T. exaltatum**T. erubescens*—w.*T. spathulatum*—c.**Alternanthera repens*—r. (noxious)**AIZOACEAE***Carpobrotus acquilatus*—c.**PORTULACACEAE***Calandrinia calytrata*—c.**CARYOPHYLLACEAE***Sagina apetala*—w.*Speigularia rubra*—w.**Stellaria media*—w.**Silene conica*—r.**Tunica velutina*—r.**RANUNCULACEAE***Clematis aristata*—c.*Ranunculus lappaceus*—w.*R. parviflorus*—w.**LAURACEAE***Cassia melanocha* c.**FUMARIACEAE****Fumaria capreolata*—w.**CRUCIFERAE***Cardamine hirsuta*—c.**Sisymbrium orientale*—w.*Alyssum limifolium*—r.*Menkea australis*—w.*Lepidium hyssopifolium*—c.*Capsella pilosula*—w.*Stenopetalum sphaerocarpon*—r.*S. lineare*—w.

DROSERACEAE

Drosera whittakeri—c.*D. planchonii*—c.

CRASSULACEAE

Crassula sieberiana—c.*C. macrantha*—c.

PITTOSPORACEAE

Pittosporum phyllireoides—w.*Bursaria spinosa*—c.*Billardiera cymosa*—c.

MIMOSACEAE

Acacia spinescens—c.*A. acinacea*—c.*A. brachybotrys*—c.*A. pycnantha*—c.*A. laskeoides*—c.*A. montana*—c.

PAPILIONACEAE

Eutaxia microphylla—c.*Daviesia genistifolia*—c.*Templetonia stenophylla*—t.**Trifolium procumbens*—w.**T. tomentosum*—w.**T. arvense*—w.**Medicago hispida*—w.**Swainsona procumbens*—t.

GERANIACEAE

Geranium pilosum—w.*Erodium cymosum*—w.**E. botrys*—w.**Pelargonium australe*—w.

OXALIDACEAE

Oxalis corniculata—w.**O. pes-caprae*—w.

LINACEAE

Linum marginale—c.

ZYGOHYLLACEAE

Tribulus terrestris—w.

RUTACEAE

Phebalium pongens—c.

EUPHORBIACEAE

Euphorbia drummondii—w.*Beyeria leschenaultii*—c.

STACKHOUSIACEAE

Stackhousia monogyna—c.

SAPINDACEAE

Dodonaea cuneata—c.

RHAMNACEAE

Spyridium eliocephalum—c.

MALVACEAE

**Malva paryiflora*—w.*Sida corrugata*—w.

STERCULIACEAE

Lasianthea baueri—c.

THYMELAEACEAE

Pimelea glauca—c.*P. corviflora*—c.

MYRTACEAE

Eucalyptus largiflorens—c.*E. leptophylla*—w.*E. leucocylon*—c.*E. dumosa*—c.*E. incrassata*—w.*Melaleuca acuminata*—w.*M. pubescens*—w.*Calytrix tetragona*—w.

HALORAGIDACEAE

Haloragis heterophylla

UMBELLIFERAE

Daucus glaberrimus—c.

EPACRIDACEAE

Lissanthe trigona

PRIMULACEAE

**Centunculus minimus*

GENTIANACEAE

Sebaea ovata—w.

CONVOLVULACEAE

Convolvulus erubescens—w.

BORAGINACEAE

Heliotropium europaeum—w.*Cynoglossum suaveolens*—r.

LABIATAE

Teucrium racemosum—r.**Marrubium vulgare*—r.*Prostanthera aspalathoides*—w.**Lamium amplexicaule*—w.

SOLANACEAE

**Lycium ferocissimum*—c (noxious)

MYOPORACEAE

Myoporum deserti—c.*M. platycarpum*—w.*Ecemophila longifolia*—w.

PLANTAGINACEAE

Plantago varia—c.

RUBIACEAE

Opercularia scabra—c.*O. varia*—w.*O. turpis*—w.*Gallium gaudichaudii*—c.

CAMPANULACEAE

Wahlenbergia bicolor—w.*W. gracilentia*—c.*W. quadrifida*—c.

GOODENIACEAE

Goodenia geniculata var. *primu-**lancea*—c.*G. varia*—c.*G. pinnatifida*—c.*G. pusilliflora*—c.

STYLIDIACEAE

Leventhoekia dubia—c.

COMPOSITAE

Brachycome leptocarpa—r.*B. lineariloba*—c.*B. aculeata*—w.*B. hargnata*—c.*B. parvula* var. *lissocarpa*—r.*B. ciliaris*—r.*(+ var. subintegerrima)**Minuria leptophylla*—c.*Calotis scabriloba*—c.*C. hispidula*—w.*Vittadinia triloba*—c.*Olearia decurrens*—c.*O. ramulosa*—c.*Cotula australis*—w.*Isotopsis graminifolia*—w.**Inula graveolens*—w.*Angianthus strictus*—c.*Calocephalus citreus*—c.*Gnaphalodes nigrescens*—c.*Craspedia uniflora*—c.*Toxanthus muelleri*—c.*Millotia tenuifolia*—c.*Ixiolaena leptolepis*—w.*Leptorhynchus squamatus*—c.*Helichrysum apiculatum*—c.*H. semipapposum*—c.*H. leucopsidium*—c.*H. bilobum*—c.*Helipterum corymbiflorum*—c.*H. demissum*—c.*H. pygmaeum*—c.*Gnaphalium latealbum*—w.*G. involucreatum*—w.*Senecio brachyglossus*—c.*S. quadridentatus*—w.**Asterotheca calcudula*—w.**Carthamus lanatus*—w. (noxious)*Microseris lanceolata*—c.**Hypochoeris glabra*—c.**Hedypnois eretica*—w.**Sonchus oleraceus*—w.

SNAKE FACTS AND FANCIES

By IAN WALLACE, *Warrington*

Down through the ages the snake has been regarded as an almost supernatural creature capable of incredible feats, and even in our enlightened era many popular fallacies about it still exist. For a number of years my brother Ron and I have kept numerous "pet" snakes and handled many more, and in the following paragraphs are set out some of our experiences and thoughts in connection with several of these common beliefs. This material is mainly for the unsophisticated, but it is hoped that more experienced naturalists, too, may glean some points from it.

It is generally believed that most snakes are pugnacious and ever ready to chase people. In Victoria the Brown Snake is the only really aggressive one, and it is exceptionally fast in its movements, too. It will repeatedly attack any object presented to it and cannot be frightened away easily as other snakes can. This attitude is usually attributed to the Tiger Snake which, in actual fact, avoids people when possible, and, when one challenges its occasional "bluff", it almost invariably turns and flees. The black snake is extremely shy and rather slow-moving in its natural environment, but will show a certain amount of temper when molested or captured. The reverse is the case with the Copperhead; it is an aggressive hunter but becomes completely "cowed" when handled. A snake's maximum speed is three or four miles per hour, hardly a rapid walking pace.*

The forked tongue of a snake, thought by some to be the fangs or "sting", apart from being harmless, is an extremely important organ. It is in use constantly, to identify prey and enemies by "tasting" their scent. A reptile cannot be rendered permanently harmless by the removal of the fangs themselves. These, actually biting teeth placed one each side on the upper jaw, if broken away, are replaced by new ones within a week or so. Normal clothing is ample protection against any snake that may be encountered in our bushland; even an ordinary woollen sock will absorb much venom from the grooved fangs and prevent them from penetrating far. By milking a snake once, only a small portion of the venom is extracted, and when this is attempted a number of times, the venom may be withheld. So there is no guarantee that the reservoir is ever exhausted.

Despite the idea that the presence of lizards in any place indicates the absence of snakes, the two are often found living quite close together and apparently in harmony. In captivity they will bask side by side in the sun. The shining scales, particularly soon after an old skin is shed, give the impression that reptiles are cold and clammy (even slimy); but actually they are about as warm always as the temperature of the surrounding atmosphere, and quite satiny to the touch.

It is said that the snake that has gone under a house can be enticed out with a saucer of milk. We have experimented repeatedly by withholding water for a period and then offering milk to our snakes. This they always flatly refused, but they drank freely of water when it was again made available. Neither by this nor by other methods tried have we ever succeeded in persuading snakes to drink milk. They are reputed to be fond of music, but our experiments indicate that they are almost deaf, relying on the sense of smell rather than sound. This is a controversial question, however, for it has been proved that some snakes do respond to

*This observation applies to progress on level ground, but on a slope a snake usually turns downhill when disturbed and makes a slithering flight at a somewhat faster speed, often towards (and past) the disturber, thus creating the erroneous impression of a swift and aggressive attack. When preparing to grasp its prey or to strike an enemy, a snake draws back its head so that the fore-part of its body forms a horizontal "S" shape, from which position the head may go forward in a lightning movement; but such rapid motion should be distinguished from the normally slow progress "across country".—Editor.

certain high-pitched notes. Were they truly susceptible, either to modern or classical music, an orchestra might have been employed, *Pied Piper* fashion, during the recent suburban snake scare.

It is difficult for us to concede that such a primitive creature as a snake can possess the highly intelligent power of hypnotism. We have observed them approaching frogs and mice which remain motionless, apparently almost paralysed with fear or else simply endeavouring to escape attention. One could imagine them hypnotised, but when the snake approaches too closely they often make a sudden move out of immediate danger. Some alleged cases of hypnotism may be due to birds putting on the "broken-wing act" when their nests are approached, fluttering to the ground and becoming prey to snakes.

Many snakes, technically dead with head crushed or severed, have been seen to have the heart still beating quite normally. I have observed this phenomenon, in one case an hour and a quarter after "death". This is a property of cold-blooded animals in general, and gives rise to the belief that a snake does not die until sun-down. This may be correct in some cases, but only when the cooling of the body causes the heart to cease functioning at that particular time.

And snakes sometimes do swallow their young, a procedure quite common with many other animals, when other food is scarce: for it is a case not of protection but simply of hunger, and the youngsters die immediately they reach the digestive juices of the stomach. It is definitely one way traffic! The fact that post mortem examinations have proved that some snakes have had live young inside them simply means that the latter were nearing birth, for many snakes are viviparous.

Though the bushmen of this country are responsible for many "tall stories", that of the hoop-snakes did not originate in Australia. One can perhaps imagine a snake taking its tail in its mouth and wriggling round in a circle after the style of processional caterpillars; but to have it erect itself and go bowling merrily down a slope would be to rob mankind of the just claim to the conception and exploitation of the idea of rotary motion.

TERNS AND DOTTERELS AT MALLACOOTA

In early January this year, several shore-birds were nesting on the sandy stretch between the ocean beach and the estuary of the Betka River about two miles southward from Mallacoota. The similarity of the nesting features of two species of different orders of birds was remarkable.

First there were the Little Terns, whose nests could be located by withdrawing a little from the area and watching the individual birds hover and then drop to the sand. When the breeze was strong enough to shift the surface, the eggs rested on the clear level sand; otherwise there was a slight depression, the making of which brought to light a few pebbles and shells. A pair of beautifully striped fluffy chicks found in one "nest" had removed to the lee of a stone some days later, and finally one only was to be found—in the fork of a small log of drift-wood.

Further from the ocean, amongst the Sea Rocket (*Cakile*), the nests of the Red-capped Dotterels were located by back-tracking the birds in the soft sand. Though the Dotterels are only half the size of the Terns, both birds lay eggs of about the same size, in nests almost identical, and of a colour pattern not appreciably different—a base of buff or biscuit colour marked with numerous dark-brown blotches and some faint purplish ones.

This parallel development of protective camouflage is a feature of the nests and eggs of groups of shore-birds the world over.

—N.A.W

NATURALISTS' NOTE BOOK

[Reserved for your nature notes, observations and queries]

SPIDERS AND BLOSSOMS

Ten years ago (*Vic. Nat.*, 60; 54) the late Mr. A. J. Tadgell commented on the spider *Nephila* assisting him by holding in her web sufficient material to enable him to recognize a misdetermination of one of his plants of the Whipstick area. The leaf-curling group of arachnids in particular are noted for such activities; and Mr. J. H. Willis comments on the enterprising spider that made a home in an empty snail-shell which she had managed to draw aloft into her web! The Hawthorn Junior Club recently saw a similar example of spider activity, information about which is supplied by Mrs. M. E. Freame:



Photo: R. D. Lee

"This specimen was a spray of *Eucalyptus cremophila* brought in to the Junior Club by Mr. Ivo Hammett. I took it home and after a couple of weeks found that as the caps loosened they were collected (evidently by a spider, for all the flowers were tangled with web and two bees were caught) and made into a neat nest. Though I watched and turned the whole thing over carefully I did not see the spider which seemed to work only in the dark. Six weeks it was working on the nest, and one day I am sorry to say the branch was knocked over, and then everything stopped. A couple of times I took it in to show the Junior Club, and may have lost the spider then, but I think it was in the fall."—EDITOR.

RAPID GROWTH OF A GOLDEN GREVILLEA

The remarkable growth of a Golden Grevillea (*G. chrysophæa*) transplanted in my garden during September (1951) may be worth placing on record. At first it consisted of a single upright stem, but three new shoots soon appeared and grew about fourteen inches in the next sixteen weeks, while along each of these new branchlets from twelve to fifteen side shoots appeared. From the time of transplanting the grevillea continued in bloom for the next two months, and produced 20 or 30 blooms next winter. It would seem that plants whose normal habitat is the gravelly capping of the Brisbane Ranges are very much at home growing in the red sands of Sandringham.

—A.E.B.

FLOWERING OF RED BEAK ORCHIDS

During last winter and spring a large number of leaves of Red Beak Orchids (*Lyperanthus nigricans*) was kept under observation at Beaumaris. Although I would estimate the number of plants at about three hundred, only three flowered. The leaves are dark green, fleshy, and grow flat on the ground. The plants seem to flower much more readily after a bush fire has passed over the area. They are known as the 'Flower of Sadness' and sometimes as 'Undertakers' because the flowers turn black when they die or are pressed.

—A.E.B.

A SOULFUL DANCE

Extract from *The Confessions of a Beachcomber*, by E. J. Banfield.

Of the many corroborances that I have witnessed, the most novel in conception was performed on Dunk Island by blacks who came from the neighbourhood of Princess Charlotte Bay, some two hundred miles to the north. The imitation of the frolicsome skip and wing movements of the native companion is one of the typical dances of the aboriginals frequenting open plains where the great birds assemble. In its performance the men—decorated with streaks and daubs of white and pink clay, and wearing in their hair down and feathers—form a circle, and bowing their bodies towards the centre, chuckle in undertones to the pianissimo tapping of boomerangs and the beating of resonant logs. In strict time, to a crescendo accompaniment, the performers throw out their arms, extend their necks downward and upward, simultaneously utter squawks in imitation of the bird, and finally whirl about, flapping their arms, ceasing instantly by a common impulse. The ballet is modelled in accordance with a study of nature.

—Submitted by F. LEWIS.

WHAT, WHERE AND WHEN

Excursions:

Sunday, July 19—Mount Eliza. Subject: Botany. Leaders: Botany Group. 8.45 or 8.53 Frankston train from Flinders Street, thence to Tower Road by Mount Martha Bus. Bring one meal. Bus leaves Tower Road for return at approx. 4.40 p.m.

Saturday, July 25—Lecture at National Museum: Fossil Murals (recently completed). Speaker: Mr. E. D. Gill, Curator of Fossils. Russell Street entrance at 2.30 p.m. Party limited to 25, names to be sent to Excursion Secretary.

Saturday, August 8—Geology Group excursion. Details at Group meeting.

Group Fixtures:

Tuesday, August 4—Geology Discussion Group. Meet at Russell Street entrance, National Museum, at 7.30 p.m.

Preliminary Notice:

Four-day Excursion to Bairnsdale—Transport, if possible, by private cars; details from Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale, W.2 (FU 1096).

Friday, October 30—Leave Melbourne early in evening, travel to Sale.

Saturday, October 31—Proceed to Bairnsdale, inspecting en route the heathlands of Providence Ponds sands area.

Sunday, November 1—To Paynesville, and by boat to Lakes National Park (Sperm whale Head).

Monday, November 2—Full day on Mitchell River flats and swamps, near Bairnsdale.

Tuesday, November 3 (Cup Day holiday)—Return to Melbourne.

(Accommodation: Hotel bed and breakfast at Sale and Bairnsdale.)

KENNETH W. ATKINS, Excursion Secretary.

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No. 836

PROCEEDINGS

Mr A. A. Baker presided and about 150 members and friends attended at the General Meeting of the Club, at the National Herbarium on July 13.

Amongst correspondence tabled was the information that Tye's Art Gallery had been reserved for a Club exhibition from September 12 to September 25 next. The President requested members to suggest suitable displays and asked for volunteers who could be in attendance. The Show, to be free to the public and open from 9.30 a.m. to 5 p.m. daily, would provide an admirable opportunity to publicize the objects and achievements of the Club.

Through Mr. H. P. Dickins, it was learned that there was to be presented to the Mitchell Library, Sydney, a series of illuminated addresses, prepared over the years 1897 to 1947, and notable for the inclusion in the decorative motifs examples of Australia's most colourful wildflowers. The album of fifty illustrated addresses was exhibited at the meeting.

There was considerable discussion about an 80-acre bushland property which might be presented to the Club for maintenance as a sanctuary; and the meeting finally agreed that the Council should investigate the matter fully so that the Club can consider the proposition at a future general meeting.

Mr. N. A. Wakefield summarized the preliminary organizing of the projected Australian Nature Show to be held in the Prahran City Hall on October 19, 20 and 21 next, and stressed that emphasis would be placed on economic aspects and every-day application of natural history knowledge.

Miss Ina Watson then addressed the meeting on her visit to Central Australia with the R. A. O. U. in 1952. With the aid of kodochrome slides, members were taken on an armchair tour of Alice Springs, Hermannsberg, Palm Valley and the Cycad Gorges, to Ayers Rock and ultimately to Mt. Olga. The photographs, faithful to the vivid colours of the inland, showed the rare beauty of wildflowers, trees and shrubs, landscapes and sunsets, which too few of those present are privileged to see in situ.

On the nomination of the President and Secretary, Sir Russell Grimwade was elected to Honorary Membership of the Club. Mr F. S. Parkin became an Ordinary Member, and Dr. C. S. Williams and Mr. F. J. Buckland were elected as Country Members.

Miss M. L. Wigan suggested that the Wattle Park tree-planting should become a coronation year gesture, and recalled that such men as Mr. E. E. Pescott and the late Charles French had originally influenced the trustees in the use of native trees and shrubs there.

NATURE NOTES AND EXHIBITS AT JULY MEETING

Botany

Mentone Greenhood, *Pterostylis toveyana*, now almost extinct, being known only from small patches such as at Greensborough. Specimens of *Litsea dralibata*, a tree of the New South Wales and Queensland rain-forests, and delightfully aromatic especially in rainy weather.—Mr. K. Atkins

Entomology

Original drawings to illustrate the type of a new genus of bees which, though of a primitive group, bear on the posterior legs the elements of the corbiculae or pollen-baskets which are otherwise found only in the highly evolved Honey Bee.—Tarlton Rayment.

GEOLOGY GROUP

Seventeen members attended the July meeting in the National Museum. The subject for the evening was a commentary on kodochrome slides given by Messrs. H. Watts and D. Jeffrey.

Miss J. Hassett described the excursion to Gellibrand Hill, Broadmeadows, a report of which is elsewhere in this issue.

The exhibits included aboriginal axeheads from Cape Everard and Heathcote (Mr. Watts), and a bone of the *Diprotodon* from the Bacchus Marsh open cut coal mine.—Mr. Gill.

VICTORIAN WILDFLOWERS NEEDED FOR WESTERN AUSTRALIA

The W.A. Naturalists' Club will be staging its "Wild Life Show" in the Perth Town Hall, from 14th to 17th September, 1953. Members of the F.N.C.V. are asked to forward some specimens of the wildflowers of this state, or any other exhibits of interest to naturalists. Would those who are able to co-operate please contact our Secretary or Editor as soon as possible?

THE FAMILIES AND GENERA OF VICTORIAN PLANTS

A new revised addition of this set of notes, issued by the Botany School, University of Melbourne, is now available. As before, it provides keys and other information necessary for identification of plants of the State. In general, the keys run only to genera, but keys to the species of *Acacia* and *Eucalyptus* are provided. (Price: 17/6, Posted 18/6). In addition, a supplement designed to bring the first edition up-to-date, has been prepared. (Price 2/-, posted 2/6). Both are available from Mr. J. R. T. Mannix, Botany School, University of Melbourne, Carlton, N.3.

BIOGRAPHY — GUSTAV WEINDORFER

Dr. George F. J. Bergman, 49a Carr Street, Waverton, North Sydney, N.S.W., requests assistance from any reader who is in possession of information about Miss Kate Cowle (later Mrs. Weindorfer), especially particulars as to her profession before her marriage in 1906. Dr. Bergman would be interested to know of the existence of any photographs of the Weindorfers, particularly if taken of the two together.

INTERNATIONAL COMMITTEE FOR BIRD PRESERVATION

Mr. D. E. Tomkins, Honorary Secretary of the Australian section of this Committee, desires information as to any Club member who might attend the 9th International Conference, to be held in Switzerland next year, and of any suggestions for the agenda of the Conference.

EXCURSION TO SHERBROOKE

On Sunday July 12, 25 members and friends (including 12 schoolchildren under the auspices of Mrs. Hellisen) visited Sherbrooke Forest. After a very cold frosty morning the sun shone warmly, and the absence of wind made it an ideal day for 'Lyrebirding'. Three males and two female birds were seen, a nest built some 30 feet up in the fork of a eucalypt was inspected, and an old nest of the previous year examined closely. Birds were singing very well, and some members of the party were lucky enough to see a display. Skins of birds seen in Sherbrooke, and whose calls are imitated by the lyrebirds were available for inspection through the courtesy of the National Museum.

The success of the excursion, from more than one aspect, may be gauged by the report submitted by the scholars of grade five from the Pascoe Vale State School:

"As Saturday night was rather foggy, we thought that Sunday would be a good Lyrebirding day. We were up early and met Mrs. Hellisen who took twelve children from our grade to Sherbrooke Forest. The first thing we noticed was the lovely smell of the bush, and the tall gum trees.

"With some Field Naturalists, we walked through the Fire-break and were thrilled to hear the first Lyrebird calling in the distance, so we followed the sound quietly until we could see a male bird, with its beautiful tail trailing behind it, raking the ground for food. We were all curious to know what he was eating so we raked the ground and found many little crustaceans. We brought one home and saw it through the microscope.

"Miss Watson showed us some mounds and a Lyrebird's nest about thirty feet up a tree. We could hear Lyrebirds singing in many directions. After lunch we were shown the skins of many birds which the Lyrebirds mimic. Then we went to see an old nest.

"The hen makes the nest herself and lays only one egg each year, and sits on it for six weeks. She has to find her own food, for her mate does not help at all. When the little one hatches, it is very ugly and stays in the nest a long time.

"On our way back to the Fire-break we scrambled through O'Dell's Gully and saw lots of ferns and mosses growing on tree trunks. There were pretty fungi too.

"Then came the best show of the day when we saw two displays. The bird threw its tail over its head and sang gloriously. It kept its feathers still for a long time, then they began to quiver as the bird danced. Some of the birds it imitated were Kookaburra, Whip-bird, Cockatoo, Crimson Rosella, Grey Thrush and Scrub Wren.

"Though we would have liked to stay longer we had to catch the bus, but it was a day we shall never forget."

—INA M. WATSON.

DISTRIBUTION OF THE "VICTORIAN NATURALIST"

When joining the Club, new members are asked to specify which copies of the *Naturalist* they wish to receive. On paying a full year's subscription the member is entitled to all back numbers of the current volume (which begins in May). During the latter part of the Club year, new members may pay half the normal annual subscription, and receive the latter six numbers of the current volume (from November onwards).

In order that the mailing list may be kept up-to-date, and *Naturalists* forwarded promptly, members should keep the Hon. Treasurer informed of any amendments required to existing addresses. Recently, thieves interfered with some Club mail at the Royal Society's Hall, and this may have caused certain dislocation in organization. Therefore, members are requested to report immediately any apparent cases of such.

NEW BEES AND WASPS, Part XX

By TARBTON RAYMENT, F.R.Z.S.*

Tasmania is not rich in indigenous bees, and many of the species are recorded from the southern littoral of Victoria. A recent survey of the 138 known species of bees of Portland showed that 24 were present in the island state. None of the bees could fly unaided across the hundred odd miles of water now forming Bass Strait, so one concludes that these must have penetrated to Tasmania before its separation from the mainland. A land connexion existed during the Permian Period, when Gondwana included portion of America, Africa, Asia, Australia and Tasmania. (See map Carnegie Institution of Washington and Schuchert's Historical Geology.)

It was, therefore, with no little interest that the author discovered a new species in a small collection of bees from the Great Lake district. The insects were taken on a species of "Everlastings", by a life-member of the Victorian Field Naturalists Club, Victor Miller. The new bee is a small black species, conspicuous for its excessively large, wide head. Though placed in the genus *Hylaeus* it is not typical and will probably be separated when more is known about it and the other sex is available for study. The species is dedicated to the memory of the late Blanche Miller, who contributed so much to the success of the Field Naturalists Club during her long association with its members.

While endeavouring to determine whether this strange specimen had any relatives in Victoria the author noticed particularly a specimen of *Euryglossa* taken at Lake Hattah, Victoria, by the late E. J. Dixon, another old and respected member of the Club. This too is small and black but is distinguished by its excessively long narrow head. The contrast between the two bees is so striking that the author has prepared a text-figure to illustrate these characters. The Tasmanian species is referred to *Hylaeus*, with certain reservations, as the author feels that it approaches the bees from Lake Hattah, which must be referred to *Euryglossa*. However, the illustrations will ensure the easy identification of both species, and the specific descriptions are included hereunder.

Family COLLETIDAE

Paracolletes obscuripennis Ckll.

Three fine males, considerably larger than specimens from Launceston, and having more of the smoky-coloured hair on head, thorax and abdomen; the tegulae are black, (red in type); the median tarsi are bright-red, the others are blackish. Great Lake, Tasmania, on flowers of *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

A series of smaller males, some with the apical segments of the flagellum excavated. Launceston, Tasmania, on flowers of *Bursaria spinosa*, January 2, 1938; leg. T. Gunton.

A series of males, not typical, being much smaller. Bolgart, Western Australia, on flowers of *Hakea* sp.; August 20, 1949; leg. Rica Erickson.

EURYGLOSSA DOLICHOCEPHALA, sp. nov.

Female—Length 5.5 mm approx. Black.

Head excessively long, bright, a very delicate sculpture; face-marks nil; frons with scattered large shallow punctures; clypeus brighter, the punctures larger; supraclypeal area impunctate, a fine groove reaching the median ocellus; vertex with a few pale hairs; compound eyes excessively long, subreniform, genae with sparse punctures, a few white hairs; labrum blackish, a long narrow oval; mandibulae with a subapical amber patch.

* Honorary Associate in Entomology, National Museum, Victoria

antennae short, segments of flagellum wider than long, light ferruginous beneath.

Prothorax with short appressed white hair; tubercles have a light spot, and a fringe of white hair; mesothorax minutely tessellate; scattered shallow punctures; scutellum and postscutellum similar to mesothorax; metathorax truncate, a delicate tessellate sculpture; abdominal dorsal segments blackish, somewhat suffused with amber, posterior margins more or less pallid, scattered punctures, a minute lineolate sculpture, a few pale hairs at apex, ventral segments similar.

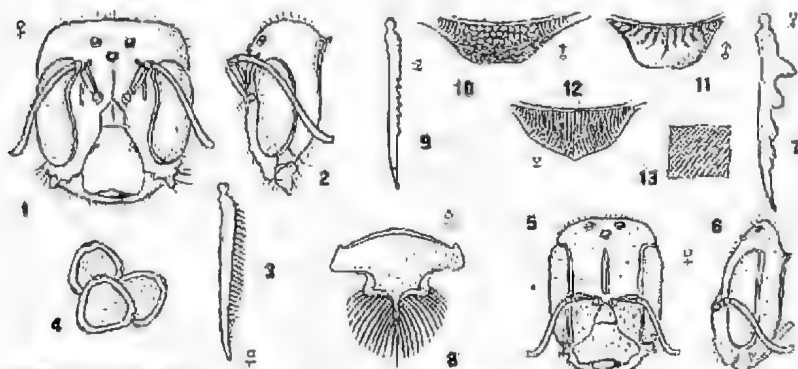
Legs brownish, with knees and tibiae amber; sparse white hair; the posterior pair somewhat apiculate basally; tarsi amber, each with a fine ctenidium; claws amber; hind calcar amber, with four or five rounded teeth; tegulae pallid, dull, wings iridescent, hyaline; nervures dilute sepia, basal arched and far short of nervulus; cells normal for the genus; pterostigma palest-amber, dark-margined; hamuli five, weakly developed.

The male is smaller, 4 mm., but otherwise similar to female.

Locality—Lake Hattah, Victoria; leg. E. J. Dixon.

Type and allotype in the collection of the author.

Allies: *E. goodeniac* Ckll., which has black nervures and a wide head. The new species is easily known by the excessively long head.



TARLTON RAYMENT

HYLAEUS BLANCHAE, sp. nov.

Type Female—Length 6 mm. approx. Black, oily-bright.

Head excessively large, quadrate, resembling that of certain *Megachile*, almost nude; face microscopically striate, a rare white hair here and there; frons with minute punctures between the lines; clypeus flat, with more numerous deeper punctures between the striae; supraclypeal area with striae more conspicuous, and a fine sulcus reaching the median ocellus, which it encircles; vertex very long, with the striae converging to the ocelli; compound eyes very long; facial foveae narrow, but deeply incised, and following the pattern of the striae; there is a slight emargination of the eyes near the base of the foveae; genae excessively large, a few more white hairs; labrum black; mandibulae black, bidentate; malar area large, striate; antennae black, submoniliform, obscurely brownish beneath.

Prothorax produced laterally to a tubercle, otherwise depressed against the mesonotum, a few more white hairs; tubercles ivory (the only pale mark on the body); mesothorax depressed along a conspicuous median sulcus; an excessively delicate close tessellation; many microscopic shallow punctures; a few white hairs; scutellum and postscutellum similar to meso-

thorax; pleura shining, with a delicate tessellation; metathorax with an area enclosed by a very fine line; the whole finely tessellate, with a few white hairs laterally; abdominal dorsal segments with a microscopic cancellate lincation; the hind margins depressed and narrowly lighter, a few loose white hairs; more shining ventral segments similar.

Legs black, slender, knees ivory, clearest on posterior pair, a few white hairs; tarsi blackish; claws bifid, reddish, very small, hind calcar amber, finely serrated; tegulae black, sculptured with a fine tessellation, shining; wings dark; nervures blackish, both recurrents received by the second cubital at equal distances; basal arched as in *Euryglossa* and reaching nervulus; second cubital cell small, contracted at top; pterostigma conspicuous, blackish; hamuli four or five, very weak.

Locality—Great Lake, Tasmania, taken on *Helichrysum* sp.; February, 1953; leg. Victor Miller.

Type in the collection of the author.

Allies: Not near to my described species. It appears to stand between *Hylaenus* and *Euryglossa*, and structure suggests some relationship to *Euryglossa dolichocephalus*, sp. nov. *H. hobartianus* Ckll. has a large head, but the area of the metathorax is different, being closely punctured; and *H. blanchae* cannot be the female of it.

Family HALICTIDAE

Halictus bassi Ckll.

One male, not quite typical. Great Lake, Tasmania, on flowers of *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

Halictus baudini Ckll.

A large robust female, almost certainly the allotype, which can be recognized from the description of the male. Great Lake, Tasmania, on flowers of *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

Allotype in the collection of the author.

Halictus boweni Ckll.

A male, not quite typical. Great Lake, Tasmania, on flowers of *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

Halictus confusus Ckll.

One female, typical in all characters. Launceston, Tasmania, on flowers of *Bursaria spinosa*, January 2, 1938; leg. T. Gunton.

One female, typical. Great Lake, Tasmania; February 6, 1953; leg. Victor Miller.

Halictus disclusus Ckll.

A series of females, which appear to be the undescribed sex, and one will therefore become the allotype should a pair be taken in cop. The black head and thorax, and pale-ferruginous abdomen give these bees a striking aspect.

Great Lake, Tasmania, on flowers of *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

Halictus gronulithorax Ckll.

One female, typical in all characters, New Norfolk, Tasmania, on "Everlastings"; January 12, 1952; leg. Vivienne Gibson.

Halictus inclinaus Sm.

Two females, rather small, with black legs. Great Lake, Tasmania, on *Helichrysum* sp.; February 6, 1953; leg. Victor Miller.

Professor Cockerell thought that the larger *H. subinclinaus* Ckll. with light-red legs, was the mainland form, but the author has both species from Tasmania.

Halictus subinclinaus.

Typical females. Launceston, Tasmania; leg. T. Gunton.

Family APIDAE

Apis mellifera, Linn

Three workers, small and very black indeed, and therefore unlike the mainland hive-bee, which has now a strong infusion of yellow "blood" from *A. ligustica* Spin., giving it a tan or orange-coloured band on the abdomen. Great Lake, Tasmania; February 6, 1953; leg. Victor Miller.

Key to Text-block

Hylaeus blanchae, sp. nov.—1. Front of large head-capsule of female; 2. Lateral view of same showing excessive development of vertex and genae; 3. Finely serrated hind calcar of female; 13. Fine striate sculpture of frons.

Euryglossa dolichocephala, sp. nov.—5. Front of head-capsule of female; 6. Lateral view of same showing the long frons and narrow genae; 7. The coarsely dentate hind calcar.

Halictus discoloratus Ckll.—8. Labrum appendage of female; 9. The hind calcar finely serrated only on the middle portion; 4. Pollen grains from the insect.

Sculpture of dorsum of metathorax—10. of *Halictus bassii*, 11. of *H. borealis*; 12. of *H. bourdini*.

AUTUMNAL FLOWERING OF SPICULAEA HUNTIANA

By W. L. WILLIAMS

Baron von Muller, the publisher of this intriguing little orchid, records it as an autumn flowering species, his specimens having come from Mount Tingiringi, New South Wales. Much later (1917) A. B. Braine discovered *S. huntiana* at Cravensville, Victoria, and for many years it was known in this State from that locality only. The flowering time was said to be November-December, by both E. E. Pescott and Dr. R. S. Rogers, in *The Victorian Naturalist* of 1926 (Vol. XLIII, Nos. 6 and 8). Rogers wrote: "I notice that its author, Baron von Muller, refers to it as an autumnal plant, but all plants received by me from Cravensville (and they have been fairly numerous) bloomed in November and December."

It is to be remarked that more recent publications (e.g. *Wildflowers of Victoria*, Jean Galbraith, with orchid section by Winifred Waddell) mention January as the flowering month. I recall Mr. A. J. Swaby telling me that he had found numerous specimens in bloom near Healesville early in the New Year—I think in January, only a few years ago.

On April 5th, this year, I came across one six-flowered specimen and another seven-flowered one near Foster's Lookout, Blackwood. Both were somewhat past their best, the two or three lowest flowers on each being partly withered, though all parts were perfectly recognizable. In only one bloom had the delicate labellum shrivelled entirely and dropped off. The majority of the flowers were fresh and in very good condition. It would be quite safe to say that a week earlier (or a fortnight at the most) the plants would have been perfect specimens—that is to say, they had been in full bloom somewhere between the 20th and the 31st of March. If the good Baron's first specimens chanced to be of this kind there would seem to be every reason for his recording *S. huntiana* as autumn flowering. (On the previous day, for instance, I had found *Eriochilus cucullatus* and *Pterostylis partiflora*).

In any case, records now seem to indicate that over the State as a whole *S. huntiana* may be in flower from November to the end of March. I am not sure enough of my ground to claim the record in flower spans for this interesting little orchid, but it must come very close to it.

[The late W. H. Nicholls once commented that he had records of the Hyacinth Orchid, *Dipodium punctatum*, flowering during each month of the year. —Editor]

BUCKSHOT GRAVEL AS A TIME AND CLIMATE INDICATOR

By EDMUND D. GILL*

Buckshot gravel is a product of a pedological process, but can be of considerable value and interest to the geologist in that it can be used for geological dating and for palaeoecological reconstructions. It is widespread in certain areas in Australia, occurring (a) in present soils, (b) in fossil soils, and (c) as a secondary deposit after erosion by water and/or wind. By reason of its physical and chemical stability, it often persists for a considerable time after its formation. It provides one aspect of "pedogenic inertia" (Bryan and Teakle 1949). Leeper (1948) says:

Ironstone gravel occurs in soils in wet climates or in wet situations, especially above a clay horizon; it seems likely therefore that it is associated with water-logging . . . The most likely explanation is that iron is reduced to the ferrous state under prolonged water-logging in the absence of oxygen. During drier periods, oxygen re-enters the soil and converts the ferrous compounds into ferric oxide

BUCKSHOT AS A TIME INDICATOR

It has been noticed that soils on volcanic-ash spreads known to be geologically youthful, such as Tower Hill in the Warrnambool District of Victoria (Gill 1950, 1953), were devoid of buckshot gravel in their soils, while those on the older ash spreads, such as at Camperdown where they are overlain in places by Arid Period dunes, possessed a well-defined buckshot horizon. The presence or absence of a buckshot horizon in the soils of a given area can thus indicate relative age. In rocks that are generally non-fossiliferous, as for example the widespread basalts and tuffs of Western Victoria, such a time indicator can be a great help in unravelling the geological history. Bryan (1952, p. 50) has also recently drawn attention to this. Degree of buckshot development can be regarded as a function of the time during which a process of leaching continues. This process carried to extremes results in a lateritic profile, i.e. gross leaching and degradation.

As slope and drainage can affect buckshot development, it is wise to consider the degree of development of this material over the whole of the geological formation concerned. Only occasional nodules, and no buckshot horizon as such, have been seen by the writer in any geological formation originating in the Arid Period or since. This suggests that, in the conditions that have pertained in Victoria in the Holocene, very little buckshot development has taken place. It looks as though something like 10,000 years at least is needed in such circumstances to produce a podsol soil with a buckshot horizon. It is hoped that radiocarbon analyses at present being carried out will throw light on this matter. There has been a pluvial period since the mid-Holocene Arid Period, but this has only formed a comparatively thin loam on the Arid Period dunes, and produced negligible quantities of buckshot in creek alluvia and such low-lying deposits more apt to be water-logged. This pluvial period caused the lakes of the Western District to be maintained at 10 to 20 feet above the present average levels, as is shown by terraces round the shores, and by emerged beds of *Coriella* shells. In places, the terraces are cut into the Arid Period dunes, and so the high levels are later than they are.

BUCKSHOT AS A CLIMATE INDICATOR

Insofar as buckshot gravel is a function of a leaching process, it is indicative of considerable rainfall. A podsolized soil, or the extreme form, a lateritic profile, cannot form in an arid period. On the other hand, the greater the rainfall and the greater the amount of water-logging, provided

* Curator of Fossils, National Museum of Victoria.

(there are intermittent opportunities for the oxidation of the soil, the greater will be the degree of buckshot development. This is well illustrated by a series of soils in a section seen in a long cutting on the Camperdown-Timbucca railway line south of the Princes Highway near Camperdown, and west of Lake Bullenmerri (see map, Gill 1953). The general succession is:

Present soil with buckshot.	Basalt
Tuff	Lateritic profile
Fossil soil with buckshot	

At the north end of the cutting on the east side, the present soil on the tuff can be seen, and the fossil soil under the tuff was proved by an auger hole which finished on the underlying basalt:

0ft. to 3ft.	Podsolized soil, grey loam overlying yellow clay with much buckshot above and in the clay.
3ft. to 5ft. 3in.	Basaltic tuff, finely bedded.
5ft. 3in. to 6ft. 3in.	Fairly heavy grey, silty clay with yellowish mottling; tough; quite well structured; a little buckshot.
6ft. 3in. to 6ft. 11in.	Heavy, grey, gravelly (buckshot) clay with yellow mottling.
6ft. 11in. to 7ft. 3in.	More-yellow, but uniform yellowish-grey in colour; buckshot almost disappeared.
7ft. 3in. to 7ft. 9in.	Calcareous clay; lime present in clay, and occurring also as hard nodules.
7ft. 9in. to 7ft. 10in.	Decomposed calcareous rock, dark brown, alternating with limey material.
9ft. 10in.	Basalt chipped by auger.

Further south in the same cutting, but on the west side, a section was examined where the basalt flow met by the auger hole outcropped, and under it was observed the upper part of a lateritic profile closely packed with buckshot right to the surface. As the basalt contacts different horizons of this profile, the fossil soil must have been eroded before the outpouring of the basalt. In the top foot, a clay loam to light clay, light brownish-grey in colour, holds the buckshot; but the next six inches consists of practically nothing but tightly packed buckshot. Under this is a light reddish-brown clay loam. There is a great depth of this buckshot horizon exposed in various parts of the cutting, and it is estimated that it is 10 to 15 feet deep.

At the north end of the cutting, opposite where the auger hole was put down, there is exposed about 10 feet of the lower part of the lateritic profile, consisting of grey, red, and yellow mottled clay. In places there is 2 to 3 feet of solid ironstone in this mottled horizon.

Thus there are three soils, all with buckshot, which reflect the climatic conditions of the times in which they were formed, viz:

1. *Tertiary lateritic profile* underneath the basalt. The deep mottled zone and the deep ironstone zone packed with buckshot show that extreme conditions of leaching existed. This fits the picture of a tropical to sub-tropical pluvial environment as indicated by the flora and fauna of the middle and upper Tertiary rocks of Victoria. Abundant warm waters severely leached and degraded the soil, while weathering processes penetrated deeply (20 to 30 feet) into the bedrock. Prescott (1931, 1944) described laterites as a product of a "humid cycle". The lateritic profile described above appears to be formed on sands and gravels that overlie Miocene calcareous clay, and in turn is overlain by a basalt of probable Pleistocene age.

2. *Somewhat leached soil* on Pleistocene basalt. The profile of this fossil soil indicates much milder climatic conditions, as reflected in the degree

of leaching. The basalt was weathered, the lime carried down in the profile, buckshot formed from similarly transported iron, and so on, but nothing like the degree or depth of degradation shown by the lateritic profile. This type of soil development is common in contemporary soils on Pleistocene basalts, as at Mt. Gellibrand.

3. *Podsol* soil on the tuff, i.e. the contemporary soil, which has been in formation long enough, and suffered leaching enough, for buckshot to form. It is known from other sections (Gill 1953) that this tuff ante-dates appreciably the mid-Holocene Arid Period. There have been pluvial periods before and since this Arid Period, and it was probably during the earlier one that the buckshot was mainly formed.

Thus it is clear that the lateritic profile formed under one type of climate, while the two later soils formed under quite another. The former climate was highly pluvial, tropical to sub-tropical, while the latter was less pluvial and cooler.

FOSSIL BUCKSHOT GRAVEL

The iron oxide of buckshot gravel and ironstone is remarkably stable. Similarly, fossils impregnated with the same iron oxide retain their red colour even after being buried for a long time in a chemically reducing environment. Thus red fossil bones are found in the grey clays of Western District lacustrine and palustrine deposits. They are derived from the sites where they were oxidized, but still retain their oxidation colour because the iron oxide is so difficult to reduce. Where old soil horizons have been eroded, often all that is left is the buckshot. G. Baker and the writer have found buckshot gravel cemented in a beach deposit on a ten-foot emerged platform on the coast west of Port Campbell, Victoria. The buckshot apparently fell to the beach during the erosion of the cliffs (not now reached by the sea), and, although all the rest of the fallen material has disappeared, the buckshot remains.

BUCKSHOT AS AN AID TO GEOLOGICAL MAPPING

In areas of low relief, superficial deposits of sand and clays often exist which are very difficult to map. In the Western District of Victoria, such deposits are found overlying Miocene marine limestone. Professor G. W. Leeper pointed out to the writer that buckshot forms only under extreme conditions on limestone, the process being inhibited by calcium ion. "Calcareous parent materials," writes Prescott (1944, p. 5), "buffer the soils against podsolization." It therefore became clear that the presence or absence of a buckshot horizon could be an indicator of whether one was dealing with a soil derived from the limestone bedrock or a soil derived from superficial sandy clays. This was tried out in the field, by checking on sections found in road and railway cuttings, drains, and break-aways in sinkholes. It was found to work very well, the buckshot marking the areas of sandy clays, and the absence of buckshot being indicative of the presence of the limestone underneath.

ACKNOWLEDGEMENT

I am indebted to Professor G. W. Leeper for describing the soil profiles, and for checking this paper.

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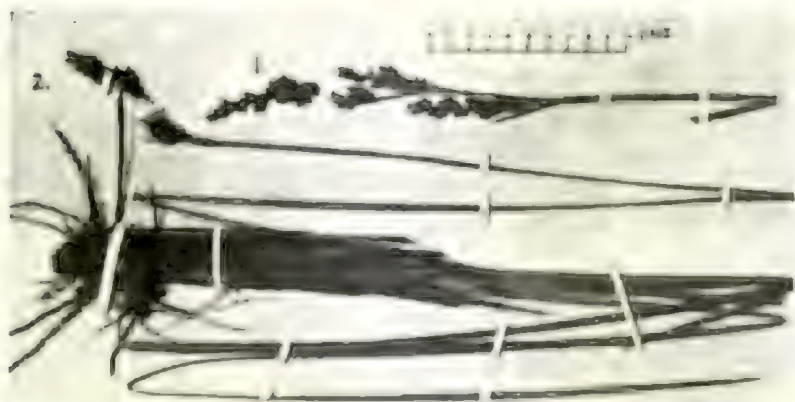
TWO NEW SPECIES OF LEPIDOSPERMA

By N. A. WAKEFIELD

This paper provides names for two hitherto undescribed species of *Lepidosperma*, both of which have been investigated by the author during several years of residence in far-eastern Victoria. In 1942, the Melbourne National Herbarium specimens of each were examined by Mr. S. T. Blake of Brisbane, but their systematic position was disputable owing mainly to paucity of material. Now that more suitable plants have been examined, the following descriptions are presented:

LEPIDOSPERMA LIMICOLUM sp. nov.—

Rhizoma erectum; folia plano-convexa; culmus biconvexis, marginis peracutis, contextu omnino duro, fibris vascularibus etiam prope centrum occurrentibus; paniculae rami densissimi erecti, bractea subtendenti in longitudine subaequali; spiculae acuminatae cinereo-brunnae; glumae appressae, inferiores latae obtusae mucronatae, superiores curvato-acuminatae; antherae longae (circa 3 mm.), filamentis longe exsertis; styli ramuli solum exserti; perianthii squamae angusto-lanceolatae, ad medium nucem attingentes; nux subargentea apice incrassata irregulari costisque stramineis.



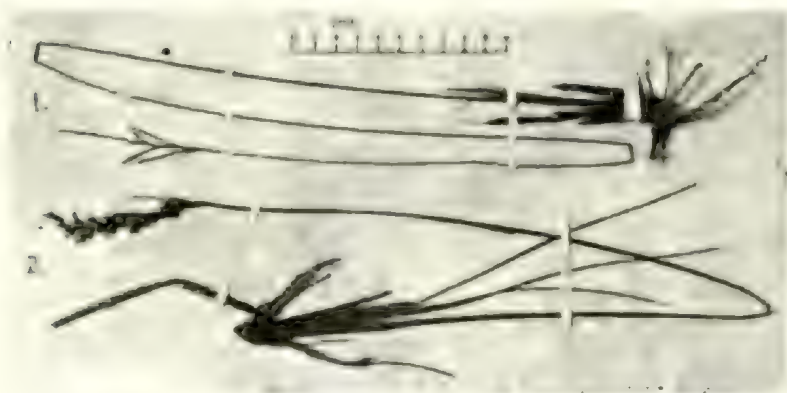
1, Inflorescence of *L. longitundine* Labill. 2, *L. limicolum* sp. nov. (N.A.W. 4720).

HOLOTYPE: Reedy Creek, three miles east of Cann River, eastern Victoria; 5/4/1953; N. A. Wakefield No. 4720. (The type specimen was flowering; the fruiting characters were determined from the author's No. 3596—see below).

Rhizome erect with erect branches, clothed with brown fibrils from the torn leaf-bases; leaves rigidly erect plano-convex, the bases broadly-sheathing and distichous; stems up to 2 metres tall, about 5 mm. wide, biconvex with very sharp cutting edges; panicle short broad, the primary branches erect very dense each about equal in length to its subtending involucre bract; spikelets acuminate pale grey-brown, each subtended by an acuminate bract; glumes rigidly appressed, the outer ones broad and obtuse scarious with prominent dark keel and mucro, the inner ones narrow curved-acuminate; filaments long-exserted; anthers about 3 mm. long; style not exserted but the stigmatic arms visible; perianth scales narrow-lanceolate entire, up to half the length of the nut; nut silver-grey, the irregular thickened apex and the three ribs straw-coloured.

The species is known to the author in several localities in eastern Victoria and south-east New South Wales, where it grows abundantly, always in sedge-bogs with its rhizomes several inches deep in black mud. As well as the type specimen cited above and some isotypes, two other collections were made at the same place (N.A.W. No. 2080, 12/11/1947; and N.A.W. No. 3596, 22/11/1948) and one from about 30 miles further east (Maramingo Creek, 29/9/1946; N.A.W. No. 3384). Ten miles further north again, plants of the species was observed at Bens Creek, 6 miles within New South Wales (8/1/1953) but none of that material was preserved. The species evidently flowers about March and the seeds mature about November.

In the Melbourne National Herbarium there are specimens of *L. limnicolum* from New South Wales—Bulli, 1875, S. Johnson; Blue Mountains, 1870, Woolls; New England, C. Stuart No. 23; and Timbarra, C. Stuart No. 14. This lot was put together by Blake, on 30/7/1942, under the label "*Lepidosperma* sp.". Another Melbourne collection labelled "Extratrop. East Austr. Dr. Leichhardt" and two of the author's specimens (Nos. 2080 and 3596) were determined by the same authority (30/4/1942, 15/1/1948 and 19/10/1949 respectively) as *Lepidosperma longitudinale*.



1. *L. urophorum* sp. nov. (N.A.W. 4271). 2. *L. canescens* Boeck. (Haptotype).

L. longitudinale has rhizomes horizontal, stems hollow (or soft-pithed) and with non-cutting edges, panicle-branches stalked and greatly exceeding their subtending bracts, glumes broad and reddish-brown, filaments short, style exserted, and the perianth scales broad and very short.

LEPIDOSPERMA UROPHORUM sp. nov.—

Species affinis *L. canescentis* sed culmis multo longioribus, habitu foliato, vaginis atque involucri bracteis nigribus earem apicibus filiformibus, paniculae rami longissimis gracilibus, bractea interiori bicarinata atque glumis inferioribus dense albido-squamosis differt.

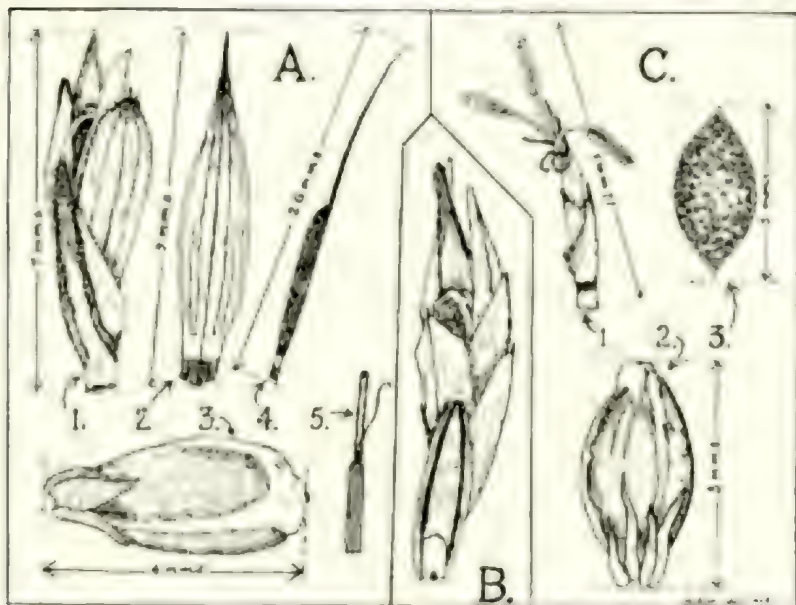
HOLOTYPE: Upper Genoa River, Victoria; 17/10/1948; J. H. Willis and N. A. Wakefield.

Rhizome horizontal; culms leafless very tall (or long) terete; basal sheaths black, the innermost blunt and bearing a long filiform tip; inflorescence a single spike or else a panicle with several slender spicate branches; subtending involucre bracts similar to the sheath; spikelets slender, appressed to the rachis; outer bract dark acuminate; inner bract broad two-keeled, very scabrous with white scales; lower glumes blunt mucronate somewhat

squamulose; upper glumes acute; nut greyish-green, the thickened apex and ribs straw-coloured; perianth scales short broad acute punctate.

L. urophorum is widespread in the lowlands of far-eastern Victoria, usually but not invariably in association with rock cliffs. The author's specimens are from Combienbar Road, Bemm River (No. 3389, 29/10/1945); and from the Reedbed near Cann River (No. 2001, August 1947; and No. 4721, 5/4/1953). Specimens examined indicate that few nuts mature, owing evidently to a small proportion of fertilization (about 10%). Perfectly flowering material has not been examined.

Specimens in the Melbourne National Herbarium are mainly from East Gippsland: Granite Rocks at the Genoa River, September 1860, F. Mueller; Everard Range, 3/6/1891, R. Helms; Wibenduck Creek (near Orbost), 1937, F. Robbins; Mount Nowa Nowa, October 1940, W. Hunter. A large suite of material of the species was collected at Bellbird Creek, near Eden.



Key to Text-block:—A.—*L. urophorum*: 1, Mature spikelet showing squamulose two-keeled bract and glume; 2, The somewhat squamulose bract which subtended the spikelet; 3, Mature nut with its broad punctate perianth-scales; 4, Bract subtending the inflorescence; 5, Part of culm and apex of sheathing bract (nat. size). B.—Spikelet of *L. canescens* for comparison with A.1. C.—*L. hemicolum*: 1, Flowering spikelet, with filaments exerted but style hidden; 2, Mature nut with its long perianth-scales; 3, Cross-section of culm showing disposition of woody bundles in the pith.

(N.B. Excepting C.2, these illustrations are from type material).

New South Wales 8/1/1953, R. Melville No. 2741 and N.A.W., in shade of trees on slope of gully in rain forest, stems 6 feet long; this is to be lodged at Kew and duplicates distributed.

The author's No. 2001 (now in Brisbane) and several of the Melbourne National Herbarium specimens were determined by Blake as *L. canescens*; which species has leaf-blades strongly developed, short culms, brown subtending bracts with long thick apices, a differently shaped inflorescence (see illustration), spikelets curved away from the rhachis, bracts and glumes without scales; and it is found only west of Port Phillip Bay.

The holotypes of *L. limicolum* and *L. urophorum* are in the author's herbarium which is lodged in the Melbourne National Herbarium; and isotypes are being distributed to Royal Botanic Gardens, Kew; National Herbarium of New South Wales, Sydney; and Botanic Museum and Herbarium, Brisbane.

I wish to record my thanks to Mr. J. H. Willis of the National Herbarium of Victoria, Melbourne, for his untiring assistance with the preparation of this paper, and to Mr. R. D. Lee of Melbourne for taking the accompanying photographs.

THE PRESERVATION OF SPIDERS AS MUSEUM SPECIMENS

By J. ROS GARNET

Soft bodied objects such as spiders and caterpillars do not lend themselves to dry-mounting. Museum specimens are generally kept in fluid preserving media, and anatomical distortions and colour changes occur. With a female Red-back spider in pickle, the red stripe was slowly fading to a dirty white even after a few days. The fluid used consisted of: Sodium chloride, 0.85 gm.; Sodium bicarbonate, 0.5 gm.; 4% Formalin solution, 4.0 ml.; Chloral hydrate, 4.0 gm.; and Water to 100 ml. (The Chloral hydrate, used to prevent oxidation and enzyme action which destroy certain colours, may be omitted.) I knew that the spherical abdomen would shrink and lose its shape, so I determined to try freeze-drying as a means of preservation, and the technique appears to be satisfactory. It involves the use of equipment not normally found outside research laboratories or modern food-processing factories, but a museum or entomological laboratory should find it worth while installing a small drying plant, for it would have innumerable uses. The apparatus needed includes a freezing box, a vacuum desiccator, an efficient desiccant, and a single stage vacuum pump. The process involved setting the object—preferably on a thin glass plate or slide—in the desired position, the tips of the feet being fixed by quick-drying cement such as cellulose acetate or Tarzan's Grip. The object is then frozen rapidly because slow freezing promotes the formation of ice crystals sufficiently large to rupture the cells. Immersion in an atmosphere cooled by either liquid air or solid carbon dioxide gas (Carba Dry Ice) is effective. The temperature of the latter is about $-70^{\circ}\text{C}.$, sufficiently low to snap-freeze such small objects. The slide is then placed in a vacuum desiccator over a powerful desiccant such as anhydrous gypsum ("Anhydrite") or phosphorus pentoxide, and the desiccator is immediately and quickly evacuated by an efficient vacuum pump to less than 300 microns (0.3 mm.). At this low pressure the object will remain frozen even though it might warm up to room temperature and, so long as the pump is working, ice will sublime from the frozen body and be absorbed by the desiccant. After a few hours the specimen will be sufficiently dry to permit cessation of pumping. It can then be left in the desiccator, still under high vacuum, to completely dry out, for two or three days if possible, after which dry air may be admitted slowly. The object may then be transferred to its museum jar and sealed to exclude atmospheric moisture. The specimens thus dried will be extremely brittle and would not withstand the pressure of a pair of forceps; hence the advantage of mounting and fixing them on a glass plate or slide for handling. The spider so dried has retained its original shape and form very satisfactorily, but its colour pattern had been obscured by the preliminary pickling process which should not be necessary in routine freeze-drying.

It may be added that the technique is also applicable to the fruiting bodies of the higher fungi, especially the more delicate forms which are not amenable to oven-drying. Following freeze-drying the plants may be dipped in a water-free quick-drying varnish, being given, thereby, some rigidity and lessening the liability to irreparable damage through subsequent handling.

GEOLOGY GROUP EXCURSION TO GELLIBRAND HILL

In a quarry on the eastern slopes, the party observed decomposed granitic rock. The felspars were seen to be altered to kaolin, the black micas were bleached, while the quartz grains were practically unaltered. The section most worked (having kaolin and fine quartz grains) showed distinctly as an intrusive rock, probably a quartz-felspar-porphyry. Above this decomposed rock were iron-stained gravels. It has been considered that this alteration may have been caused by solutions and gases from tertiary volcanic lavas which were deposited over this portion of the granite mass. [Ref.—A. J. Gaskin. *Proc. Roy. Soc. Vic.* Vol. LVI Part I, N.S. p. 13].

The party then visited a quarry near the summit, originally worked as building stone for the old Princes Bridge, the Chief Secretary's Office, and the Melbourne Town Hall. Showing poor jointing, this granitic rock is termed adamellite. An aplite dyke traversing the bared rock surfaces and examples of exfoliation due to temperature weathering, were observed on the northern slopes.

The topography of the area was clearly viewed from the summit of the Hill. An extensive quarry of Silurian sediments on the southern slopes was only observed from the road, while in the road cutting these sediments showed prominent folding.

—J. HASKETT.

NATURALISTS' NOTE-BOOK

[Reserved for your notes, observations and queries]

BIRDLAND AIRLIFT

Recently I watched a Pied Currawong (*Strepera graculina*) which discovered a whole slice of bread and wished to move it to a more secluded cover. Taking the bread in its beak it rose from the ground, and, as soon as it was in full flight, dropped it and caught it neatly in both claws. Just before landing fifty yards away, the Currawong took its bird in its beak again to leave the feet free for landing. A moment or two later it was disturbed and flew another fifty yards or so, exactly repeating the first manoeuvre with the bread.

—JEAN GALBRAITH, Tyers.

IMPROVEMENT OF NATIVE PLANTS

Although nature has developed native plants able to withstand hard conditions, it is interesting to see better plants result when given more congenial conditions. A good example is the Flame Heath (*Astroloma conostephioides*) planted in my garden. It became far superior to any observed in natural habitats, and, after 15 years, still shows no signs of deterioration in form, foliage or flower.

—J. E. SEATON.

A VAIN BLUE WREN

A family of Superb Blue Wrens, at present numbering seven, are frequent visitors to our garden. They are always welcome, not only on account of the lovely blue feathers of the mature males, but because their animated movements and spirited chirping are such a delight.

One of these birds, a male with his full complement of blue feathers, developed the habit of picking a yellow petal from a Cassia bush and flying between various vantage points with the petal in his beak, often including two or three visits to the Cassia with the same petal.

As the gold petal provides a beautiful contrast to the blue markings of the Wren, we can only conclude that he likes the effect produced as much as do we who observe him.—A.E.B.

WHAT, WHERE AND WHEN**Excursions:**

Sunday, August 16—Five miles, from Mt. Evelyn to Mooroolbark. Subject: Botany. Leaders: Botany Group. 9.12 a.m. Warburton train from Flinders Street, alight Mt. Evelyn. Bring one meal.

Saturday, August 22—Afternoon excursion to Mt. Royal Home. Subject: Acacias. Leader: Mr. J. R. Garnet. Take either West Coburg train in William Street, alight at Royal Park (Zoo) station, or Coburg train from Flinders Street. Meet 2.30 p.m. at tram stop beside Royal Park station. The leader desires some native shrubs for planting to commemorate the visit.

Sunday, August 30—Bendigo. Subject: *Hakea*, *Acacia*. Leaders: Bendigo F.N.C. Take 9 a.m. Bendigo train from Spencer Street, fares £1, 15/-. Returning train arrives Melbourne 9.40 p.m. Bring two meals. Party limited to 12, names to K. Atkins, Botanic Gardens, South Yarra, S.E.1.

Saturday, September 5—Geology Group Excursion. Details at Group Meeting.

Sunday, September 6—Mt. Eliza. Subjects: Botany and Birds. Leaders: Frankston F.N.C. Take 8.47 or 8.53 a.m. Frankston train from Flinders Street, then to Tower Road (Mt. Eliza Golf Links) by Mt. Martha bus. Bring one meal. Bus leaves Tower Road approximately 4.40 p.m.

Group Fixtures:

Tuesday, September 1—Geology Discussion Group. Meet at Russell Street entrance National Museum at 7.30 p.m.

Preliminary Notices:

Saturday, September 19—Botany Group Excursion. Seven mile walk from Nyora to Lang Lang.

Saturday, October 10—180 mile Parlorcoach trip to Creswick. Subject: Orchids. Leader: Mr. A. Sonsee, President of Ballarat F.N.C. Coach leaves Batman Avenue 8.15 a.m. returning approximately 7.30 p.m. Fares 17/-. bookings with Mr. K. Atkins, Botanic Gardens, South Yarra, S.E.1.

Saturday-Sunday, October 10-11—Our Club members have again been invited by the Maryborough F.N.C. to spend a week end at Maryborough. Transport, if possible, by private cars; camping facilities available at Princes Park. Members who desire hotel accommodation to make own arrangements.

Saturday, October 31—Tuesday November 3, Cup day—Four days excursion proposed to Bairnsdale district. Transport by private cars. Can any members provide private cars with caravan towing facilities. Leader Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale, W.2. (FU 1096).

Friday, October 30—Leave Melbourne early in evening, travel to Sale.

Saturday—Proceed to Bairnsdale, inspecting en route the heathlands of Providence Ponds area.

Sunday—To Paynesville, and by boat to Lakes National Park (Spermin Whale Head).

Monday—Full day on Mitchell River flats and swamps near Bairnsdale.

Tuesday, (Cup Day)—Return to Melbourne.

Accommodation: Hotels, bed and breakfast at Sale and Bairnsdale. Other meals at cafés or take with party.

—KENNETH W. ATKINS, Excursion Secretary.

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PROCEEDINGS

At the General Meeting of the Club held at the National Herbarium on August 10, Mr. A. A. Baker presided over an attendance of about 130 members and friends.

Distinguished visitors included Professor Eames, formerly of Cornell University, who is well known among botanists for his work on wood anatomy, and who is now in Melbourne on a Fullbright Scholarship.

Correspondence included a request from Professor B. Kastiew, of 52 George St., Norwood, S.A., for the assistance of members in collecting a herbarium of Victorian native plants.

The President appealed for help in setting up, supervising, and dismantling the forthcoming Club Display to commence at Tye's Art Gallery on September 14.

The meeting was then addressed by Dr. Clunies Ross, Chairman of the C.S.I.R.O., on "The Reclamation of Desert Lands". A report of this appears elsewhere in this issue. At the conclusion of this lecture, a vote of thanks was moved by Dr. M. M. Chattaway, supported by Professor Turner, and carried with acclamation.

Miss M. J. Lester was elected as an Ordinary Member and Mrs. E. J. Woodburn and Mr. F. L. Johnston became Country Members. One of our members, Mrs. Fisch, was welcomed back after her visit to Switzerland.

GEOLOGY DISCUSSION GROUP

The August meeting, held in the National Museum, had an attendance of 16 members.

Mr. Baker reported on the result of the survey being done along the Darebin Creek; the section traversed on July 11 being from Smith Street, Alphington, to Darebin Road, Northcote. Columnar basalt and pavement were observed, as well as extensive, vertical, irregular cracking of the basalt cliffs at the section below Smith Street foot-bridge. Further upstream the creek narrows, and two bars of basalt traverse the stream. This probably affected the drainage system of the area during the outpouring of the lava. Other features observed in this same section substantiate this view, and further study is being undertaken.

The subject for the evening was a talk by Miss Barbara Nielsen, entitled "The Origin of Ore Deposits". This dealt with ore and gangue minerals, syngenic and epigenetic deposits and sedimentary deposits, and was illustrated with sketch maps and hand specimens.

Erratum: The bone exhibited by Mr. Gill at the July meeting—*Vict. Nat.* 70: 66—had not been identified as belonging to a Diprotodon, but was a scapula of a large animal.

NATURE PHOTOGRAPHIC COMPETITION

The Victorian Association of Photographic Societies, in conjunction with the Field Naturalists Club of Victoria, is conducting a Nature Photographic Competition, the entries for which will be displayed at the annual exhibition of the Field Naturalists Club of Victoria at the Prahran Town Hall on October 20, 21 and 22, 1953.

The competition is open to all. There is no entry fee and no entry forms are required. The Association's Print Award Stickers will be awarded to prize-winners together with the following trophies: First, £3/5/-; second, £3/3/-; third, £1/1/-. Other entries may, at the discretion of the judges, be awarded special recognition stickers. Judging will be conducted by a panel of photographers and naturalists.

RULES AND CONDITIONS OF COMPETITION

1. Entries shall be of a recognized natural history subject
2. Prints are to be on standard mounts, preferably 20 in. by 16 in., although mounts 16 in. by 12 in. will be accepted.
3. Prints may be by any recognized photographic process
4. Monochrome prints coloured by hand with oil colour, water colour or crayon, etc., are not acceptable.
5. Entries may be forwarded to the Honorary Secretary of the Victorian Association of Photographic Societies (Mr N. B. Crouch), either by post to 15 Denver Crescent, Elsternwick, Victoria, or by rail to the Elsternwick Railway Station after advising him by letter, or to any of the following:

Camera Supply Company, 330 Elizabeth Street, Melbourne.

Kodak (A/asia) Pty. Ltd., 252 Collins Street, Melbourne.

Herbert Small Pty. Ltd., 308 Collins Street, Melbourne

York Camera Shop, 294 Lit. Collins Street, Melbourne.

Postage or freight must be pre-paid and entries sent to the above-mentioned addresses should be in sealed packets marked "V.A.P.S. Nature Photographic Competition". Name and address of sender together with instructions for return must be enclosed. Where applicable return postage or freight must be included.

6. The Victorian Association of Photographic Societies will exercise every care but cannot accept responsibility for loss or damage to entries.

7. The judges' decision is final.

8. Entries close October 7, 1953.

NATURE NOTES AND EXHIBITS AT AUGUST MEETING

Silver Gulls: Miss I. Watson commented that Silver Gulls at Altona are nesting about a month later than usual. This she believed to be due to the scarcity of pond life caused by low salt concentration in the pans where the birds nest. Mr. A. B. Scott stated that there appeared to be no shortage of pond life, such as rotifers and volvox, in other areas.

Maroonhoods, *Phreatia pedunculata*: Mr. W. L. Williams showed a pot of these orchids collected from a poor soil area some five years ago. During the first three years of cultivation scarcely any increase occurred, but after a top dressing with superphosphate and well rotted manure nine plants have appeared and several of these are about to flower.

Mr. Garnet recalled that the late W. H. Nicholls used rock phosphate to provide extra nutrients for his epiphytic orchids. The roots soon attached themselves to the guano and the plants appeared to thrive exceptionally well. He had noticed when growing terrestrial orchids that they thrived better during some years, but this depended on the regularity of overhead watering rather than on whether they had been top dressed or not.

Devil's Claw: This is the fruiting body of a plant, *Proboscidea jussieu*, which is the bane of pastoralists in New South Wales. The exhibit showed how the "claw" embedded itself in the wool of a sheep.—Miss M. L. Wigan.

Charred Timber, thought to be Red Gum, and excavated about fifteen feet below the surface at the present water level of the Maribyrnong River, was exhibited by Mr. A. B. Scott. It showed the remains of a longicorn beetle and a large torado worm. From its contents and position can be deduced an interesting picture of the recent geology of the locality.

AUSTRALIAN NATURE SHOW

Except for possible minor adjustments, the floor plan and details of exhibits are now arranged for the forthcoming F.N.C.V. Nature Show, to be held in the Prahran City Hall. Various considerations indicate that the two-day period originally planned would not do the show full justice, and it will therefore be open for three full days—Tuesday, Wednesday and Thursday, October 20, 21 and 22. Extra stewards will now be needed from the ranks of the Club, and this matter will be brought before the September General Meeting.

—N. A. WAKEFIELD.

A CENTRAL AUSTRALIAN TREASURE CHEST

[From a talk given by Miss Ina Watson at the July meeting of the Club]

"One of the most interesting birds we saw in Palm Valley was a male of the Western Bower-bird (*Chalmydorn guttata*) and we were never tired of watching his actions. He was about the size of a Mountain Thrush, of brown colour spotted with golden-tawn and with nape feathers of a rare lilac-pink. His bower was composed of thin sticks and pieces of spinifex, a horseshoe-shaped structure under the drooping branches of an acacia. The 'floor' was quite thick, and the bower had obviously been in use for some years. It was decorated around the 'front entrance' with a collection of bleached vertebrae and other bones and a few bright green thorny berries. At this, as well as at another bower seen, there was the body of a black and gold grasshopper still alive but with all the legs removed.

"At approximately hourly intervals, the male bird visited the bower for some five to fifteen minutes. He hopped round and about, busily pushing sticks into place in the walls of the bower and shifting some of his treasured decorations, the most precious of which were right in the centre of the bower—one or two green berries, two pieces of glass, and the shining lead top of a Kodak film container.

"We decided to experiment, and in the intervals between visits placed 17 of the yellow heads of 'Billy-buttons' in the bower entrance. Back he came and his actions left no doubt as to his displeasure. Hopping unhesitatingly to the yellow flowers, one at a time he picked them up, hepped outside the radius of his 'home' and, with a flick of his head, cast each offending object well away. He didn't stop until he had disposed of them all. Our next experiment was with a shilling-piece, but this was a different matter: the bird took it with delight, and it was put in the centre of the bower with his other treasures. (I regret to have to tell you that the coin was retrieved by its original owner before he left!) Knowing the predilection of our southern Satin Bower-bird for all things blue, we coated two small stones with a mixture of washing blue, but these also were rejected and cast out as were the yellow flower heads.

"This bird was observed consistently for two days, and in that time the female visited the bower only on two occasions. Then the male bird showed great excitement and the lilac neck plumes were displayed."

THE RECLAMATION OF DESERT LANDS

[Summary of Address to Club on August 10, 1953, by Dr. Clunies Ross]

The term "desert", as applied to the areas in Australia with which the C.S.I.R.O. investigations have been concerned, is used with certain reservations. In point of fact the Ninety-Mile Desert in South Australia is, for example, far from being a desert in the accepted sense of an arid and completely infertile region. Coonalpyn Downs, as it is now officially named, with an average annual rainfall of more than 18 inches, supported a relatively dense native heathy vegetation—predominantly of the Mallee-Broombush association. Despite this rainfall and vegetational coverage the vast area was of little economic use even for sheep grazing.

Attempts at introducing fodder crops of certain grasses and legumes had been successful to only a very limited extent because, as investigation subsequently showed, the soil itself lacked some of the mineral elements essential for the nutrition of these plants. The addition of zinc and copper in minute amount permitted lush growth of legumes such as lucerne and subterranean clover, and its continued cropping soon built up in the soil an adequate nitrogen content. With further additions of phosphorus and sulphur in the form of superphosphate the hitherto "hungry" soil became fertile enough to support a population of cereals and fodder grasses sufficient to soon turn the "desert" into an economically valuable region for primary production.

Although solving some of the problems of desert land reclamation, top dressing with fertilizers and trace elements created new problems for research. In regions where pasture grasses and legumes seemingly thrived, sheep grazing on *Phalaris tuberosa* tended to infertility and to what is known as "phalaris staggers". This was found to be due to trace-element deficiency, this time, cobalt—a substance evidently not present in the grass in amount adequate to maintain a ruminant in health. Researches on animal nutrition have shown that cobalt is an essential constituent of the anti-anaemia factor, vitamin B12, ingestion of which by the animal quickly relieved it of the symptoms of phalaris staggers. In the same way ingestion of that vitamin by human beings is the remedy for pernicious anaemia.

Both by observation and experiment it is being revealed that there is a close relationship of plant and animal nutrition. Although top dressing with selected trace-elements might provide what is apparently excellent pasture, such fodder could be inadequate for animal nutrition. The explanation for this lies in the capacity of the plants to take up these trace-elements in amounts properly balanced for such nutrition. It is important to control the copper-molybdenum balance. Although the latter metal is an essential factor in the nutrition of ruminants, in excess it adversely affects the store of copper in the animal's system. The further the investigations are pressed the clearer does it become that each soil type poses its own problems, both as to precisely what elements should be added to it, what vegetation should be cultivated on it and what animals should be grazed upon the vegetation.

It is clear that the existence of our primary industries now depends largely on the application of knowledge gained by scientific research into such problems. It has been shown that the character of wool itself is directly influenced by the animal's nutrition. The "steely wool", despised so much by growers because it resembles artificial fibre, is due solely to a copper-zinc deficiency. Some of the finest wool is a product of sheep starved of some nutritional requirement, and it is clear that the variation in the quality of the wool in one flock as compared with another can be explained in terms of differences in the soil and the vegetational cover on which the flocks graze.

Coonalpyn is spectacular because it is an example of reclamation on a vast scale, where each year 30,000 acres are being turned into productive lands, where wheat and sheep—Australia's top industries—are superseding Mallee and Melaleuca. There is no likelihood of the present reclamation plans com-

pletely wiping out some of Australia's most notable or rare wildflowers. Hundreds of thousands of acres will still remain untouched by such development. There still remain many highly interesting subjects for scientific inquiry, for it is not known how the native vegetation thrives in the absence or paucity of those very minerals which are essential for the growth of the introduced plants.

The A.M.P. Settlement of Coonalpyn Downs is undertaken with due regard to soil conservation. Shelter belts of unaltered land are distributed in accordance with the advice of the State Soil Conservation Authority. It has been found that fencing is lagging behind reclamation, but fortunately myxomatosis has effectively stopped rabbit invasion. The absence of permanent streams is no hindrance to the maintenance of a mosquito population, and even when seasonal conditions reduce these insects to negligible numbers (and they are the main vector in transmission of the myxoma virus) there are plenty of other insects capable of harbouring and transmitting the disease.

The danger of "salting" from continual top dressing is almost negligible. The original vegetation would probably re-establish itself if top dressing and cultivation were discontinued. Already in some parts of the Downs, blackboys (a species of *Xanthorrhoea*) are reappearing.

MEMORIALS TO NATURALISTS

By ALEC H. CRISHOLM, Sydney

With the passing remark that Donald Macdonald never rendered his name "MacDonald" (as given in the *Pict. Nat.* for July), I should like to say that it is refreshing to learn that a committee from the P.N.C.V. is to assist in the care of the memorial erected to the memory of a very notable naturalist. Like many others, I owed in boyhood a good deal to the stimulus imparted by Donald Macdonald through his writings in the Melbourne *Argus*. Moreover, he was in the chair when I, as a country youth, first attended a bird observers' meeting in Melbourne (in 1907), and a few years later, when I was transferring to Queensland, he wrote me sage advice on how to conduct a column of nature gossip in the north. Later again I succeeded Mac in the conduct of Nature Notes in the *Argus*, and, as matters fell out, I was Editor of that newspaper when its readers resolved (in 1938) to erect the memorial. I have therefore considerable personal interest in the welfare of the Macdonald Memorial—the first one of its kind to commemorate an Australian naturalist—and I hope very much that it will be efficiently safeguarded.

The same hope may be expressed in regard to the Gossip Memorial. As most members will recall, this handsome structure was erected in Ararat to commemorate George Gossip, a cheery and public-spirited citizen who did a great deal of national service in the propagating and preserving of native plants. Advice received recently indicates that much vandalism has occurred in Ararat's valuable little national park, and one can only hope that the damage has not extended to the Gossip Memorial.

A third example of the bush memorials dedicated to naturalists belongs to the Drakesbrook district of Western Australia. Erected in 1944 by the Royal Australasian Ornithologists' Union and the Historical Society of Western Australia, it commemorates the pioneer birdman John Gilbert and his botanist companion James Drummond (who were in the area in 1842), together with *Atrichornis clamosus*, the remarkable Scrub-bird (now possibly extinct) which Gilbert obtained in that district.

There are, of course, distinctive memorials over the graves of various eminent naturalists—notably those of J. W. Lewin in Sydney, Baton von Mueller in Melbourne, and "Beachcomber" Banfield on Dunk Island, North Queensland—but the Macdonald, Gossip, and Gilbert-Drummond Memorials appear to be the only "independent" examples in kind, and as such they merit special consideration.

DISTRIBUTION OF THE TASMANIAN DEVIL, THE TASMANIAN WOLF, AND THE DINGO IN S.E. AUSTRALIA IN QUATERNARY TIME

By EDMUND D. GILL*

Occupation of Australia by Europeans is often given as the sole cause of extinction of many members of our native fauna. While this occupation has had profound effects, it is not the sole cause. In late Pleistocene and Holocene times numerous species have become extinct in Australia, and some were almost so when white people came to settle here. The Tasmanian Devil and the Tasmanian Wolf, now limited to the island State, were once common on the mainland. The introduction of dogs by Europeans has been blamed for the destruction of much of our native fauna, and while this is certainly a factor, it is shown that the native dog or dingo has been in this country for many thousands of years.

THE TASMANIAN DEVIL—*SARCOPHILUS*

This marsupial is limited to Tasmania at present, but unlike the Tasmanian Wolf, it is not becoming extinct. Being a wild creature, *Sarcophilus* avoids built-up areas, and so the European occupation of the island has resulted in the driving back of this animal, and reduction in numbers. A few hundred years ago (or possibly less), the Tasmanian Devil was still living on the mainland. Mahony (1912) recorded *Sarcophilus harrisi* from an aboriginal kitchen midden at the Koroit or Tower Hill beach, north-west of Warrnambool (Gill 1951), and a radio-carbon date for this site makes it 538 ± 200 years (Libby 1951, Johnson 1951), i.e. somewhere between 338 and 738 years. The large margin of possible error is due to the difficulty of measuring such a recent sample. Analysis of the fluorine content of a bone from this midden relative to its phosphate content supports the radiocarbon dating in showing that the deposit is a very recent one. The writer has found the jaws of Tasmanian devils in three midden sites along the coast in the Tower Hill area. The bones are all white and unmineralized. Finding *Sarcophilus* on midden sites suggests that the aborigines used it for food. Kershaw (1912) recorded the capture of *Sarcophilus* at Tooborac, 63 miles from Melbourne, but did not know whether it was indigenous or a specimen escaped from captivity. The latter is now obviously the interpretation, because if there were a population of Tasmanian devils at Tooborac large enough to maintain the species, residents could not fail to be aware of its presence in this comparatively settled district. This marsupial was not long ago common in Victoria, as the following records show, but it became extinct in this State quite a short time before the arrival of Europeans. It appears likely that the Thylacine died out first on the mainland, just as it is the first of these two marsupials to approach extinction in Tasmania.

When Kershaw exhibited to the Field Naturalists' Club the specimen of *Sarcophilus* from Tooborac, he also exhibited a fossil one from the east side of Lake Corangamite, western Victoria. The skull and a ramus of the lower jaw (P15285-6)† were collected by W. Wallace of Cororooke, and presented to the Museum on 7/8/12. The bones are yellowish, unmineralized, and probably quite recent. Fragments of unmineralized jaws and teeth were found at a depth of eight feet in a shell deposit (probably a *Coriella* bed) on "Bullumbar", North Cundare, near Lake Corangamite, and sent to the Museum on 1/10/13 by Thomas Bath. Another skull was obtained from a railway cutting at Little River between Melbourne and Geelong.

Dr. G. B. Pritchard collected from a limestone cave on the Point Addis oil lease on the Glenelg River, the remains of at least three individuals, asso-

* Palaeontologist, National Museum, Melbourne.

† Numbers so given are registered numbers in the palaeontological collection of the National Museum of Victoria, Melbourne.

riated with an extant fauna including kangaroos, wallabies, native cats, rat-kangaroos, wombats, dingos, and birds. The bones are all yellow and unmineralized. Colliver (1938) found *Sarcophilus* in a dry cave on the Glenelg River, near Nelson, associated with Tasmanian Wolf, kangaroos, wallabies, marsupial mice, lizards, and birds—twenty-six species in all. McCoy (1882) figured *Sarcophilus urinus* (= *S. harrisi*) from a cave on the east side of the freshwater Lake Purrumbete (P 2283), which consists of volcanic tuff and lapilli. The same writer figured a specimen (P 7432) from Queenscliff, Port Phillip, reported as coming from "the sandy bed intercalated with the" scoriaite, and another (P 1857) from a cave five miles south-east of Gisborne (see also Quarter Sheet 7 N.W.).

What may well be a more ancient Tasmanian Devil is represented by a small ramus of a lower jaw obtained from a depth of 50 feet in allotment 42, parish of Smeaton. The bone is mineralized, fawn to bluish in colour, while the one tooth present, a molar, is cobalt blue in colour due to the mineral vivianite. The fossil was presented to the National Museum by J. Marshall in 1914.

Sarcophilus harrisi is recorded also from Western Australia (Glauert 1914), South Australia (Hale and Tindale 1930), and New South Wales (Owen 1877).

BIGGER AND STRONGER DEVILS

Just as there were giant kangaroos, giant wombats, giant koalas, giant cuscuses, giant echidnas, and so on during the Ice Age, so there were also giant Tasmanian Devils. In the Queen Victoria Museum at Launceston, Tasmania, there are preserved bones obtained from a cave at Scotchtown, 3.2 miles south of Smithton on the north-west coast. These include a giant *Sarcophilus*, whose jaw measurements vary from 15 to 50 per cent larger than an average extant *Sarcophilus* (see plates). Similarly in Victoria, there has been found in the Camperdown district a jaw of a giant Tasmanian Devil, whose age is believed to be Pleistocene. These specimens (the latter received recently from Mr. J. Manifold) have not been recorded before, and are no doubt referable to *Sarcophilus lanianus* Owen (1838, 1877) which has been recorded earlier from Queensland, Western Australia and New South Wales. Simpson (1930) records *S. lanianus* as occurring in Victoria, but so far I have been unable to locate the specimen on which this record is based. Owen says that Tasmanian Devils of both extant size and giant size were found together in the Wellington Caves in N.S.W., but that the latter were more numerous. Along with the other giant forms of the Ice Age, *S. lanianus* has become extinct, and indeed it is the tendency even now for the larger marsupial forms to die out and the smaller ones to prove more virile in relation to the existing conditions. *S. lanianus* was discovered at the Balladonia Snak in an arid part of Western Australia along with the bones of the huge *Diprotodon*, a giant wombat, a number of giant kangaroos, and the so-called marsupial lion *Thylacoleo* (Glauert 1912). In those times an ample rainfall must have fallen in that area to grow enough food to support populations of these huge animals, so the climate must have been very different from the present arid one.

The short broad head of the Tasmanian Devil is packed with masses of muscle that make it one of the most powerful in the world for its size. Fleay relates (1946, p. 157), "We caught 19 devils in the wire traps Some large males twisted the chain wire with their powerful jaws in a phenomenal fashion. One cut his way right through the wire and escaped, leaving a fringe of black hair around the opening." The head of the extinct Devil was not only larger but also more robust, so it must have had exceedingly powerful jaws.

THE TASMANIAN WOLF—*THYLACINUS*

The Tasmanian Wolf or Tiger (the former is the more appropriate name) is the largest living polyprotodont, and it has lived in Australia for a very long time. Its scientific name *Thylacinus cynocephalus* means the pouched dog with the wolf head. Like the Tasmanian Devil it used to roam the mainland, where it is now extinct. It is almost extinct in Tasmania, but traces of it have been found in recent years (Spencer 1944, Fleay 1946). However, as the population of thylacines has fallen so low, extinction will unfortunately soon come. H. H. Scott, then Director of the Queen Victoria Museum, Launceston, wrote to the National Museum, Melbourne, on 29/5/03, "I am sending a *Thylacinus* by the *Coogee* this morning. The animal was trapped for you in the mountains and on the way to me it died . . . The *Thylacinus* is now rare, and very hard to come by at all . . . The two devils will be sure to reach you alive as they are very hardy and stand anything, while their congener the Thylacine is exactly the reverse." It appears from correspondence that up to the beginning of this century there was no difficulty in obtaining thylacines in Tasmania.

Fossils referable to the living species *Thylacinus cynocephalus* have been found in Victoria in a cave near Gisborne (P 7427-1430), and in a cave near Nelson (Colliver 1938). The species is also recorded from Western Australia (Glauert 1914, 1926), and New South Wales (Broome 1896). As David and Browne have commented (1950, p. 646), "Most of the fossil thylacines were bigger than the living species and differed in other respects, but the latter has been described from the Wombeyan Caves and the Mammoth Cave." Two species of fossil thylacines have been described, *Thylacinus major* (Owen 1877) from N.S.W., and *Thylacinus rostralis* (De Vis 1894) from Queensland and Victoria. The thylacine is also found fossil in Tasmania along with the giant extinct marsupial fauna, so it must have been there for a long time. It may be significant that the Thylacine and Devil, which did so well all over Australia in the Ice Age, are now confined to the coldest area of Australia. Some thylacine remains were found in the same cave at Scotchtown, north-west Tasmania, as held the giant *Sarcophilus* (see Plate VIII, bottom).

THE DINGO OR WARRIGAL *CANIS FAMILIARIS DINGO*

"Recent scientific opinion maintains that the dingo was introduced to the continent by the aborigines, or adjacent native peoples, by a northern sea-borne route in ages past" (Troughton 1951). How long ago did this happen?

The first white man to settle at Lake Colongulac, just north of Camperdown in western Victoria, was William Adeney, who arrived there in 1843. There was but a narrow beach to the lake then, and from this Adeney picked up fossil bones washed from the cliffs. They included the giant *Diprotodon*, the so-called marsupial lion *Thylacoleo carnifex* (the type specimen), five species of giant kangaroos, Captain Cook's kangaroo (*Macropus cookii*), an ancient wombat, an extinct thylacine, and the dingo. For over a century the bed from which these fossils came was not discovered, but was recently found. During the great Arid Period of 5,000 to 6,000 years ago, most (if not all) the Western District lakes dried up, and the flat-floored ones had dunes of windblown material raised across their floors and along their east and south-east sides. At Lake Colongulac, the tuff from the local volcanoes underlies these ancient dunes which are now much dissected. Lower still, underneath the tuff, are old lake deposits, and in these the bones are found (Gill 1951, 1953). This indicates a considerable antiquity for the dingo in Victoria. With the help of the Field Naturalists' Club Geology Group, thousands of tiny *Coriisella* shells have been extracted from the rock of the bone bed so that a radiocarbon analysis can be made, which will give the age of the bed (and so the fossil dingo) in years. A fossil dingo was found

PLATE VII



Living and Fossil Tasmanian Devils

Left: Non-fossil skull of *Sarcophilus harrisii* as shown in Plate VI.

Right: Part of upper jaw of *Sarcophilus laniarius* from Scotchtown Cave, N.W. Tasmania. The incisor (Q.V.M. 1953.39.3) appears to belong to the piece of upper jaw (Q.V.M. 1953.39.4) with which it is associated in the photograph, but the two were found separate in the fossil collection. See also Plate VIII.

PLATE VIII



Tasmanian Wolf and Devil

Top: Two lower canine teeth of *Thylacinus cynocephalus*. The upper is non-fossil (Nat. Mus. coll.), while the lower is from the Scotchtown Cave, N.W. Tasmania (Q.V.M. 1953.39.5).

Centre: Part of ramus of *Thylacinus* cf. *cynocephalus* from the Scotchtown Cave (Q.V.M. 1953.39.6).

Bottom: *Sarcophilus laniarius* from the Scotchtown Cave. Side view of specimen shown in Plate VII. Another piece of upper jaw, which is not figured and comes from the same locality, is Q.V.M. 1953.39.7.

PLATE VI



Fossil and Living Tasmanian Devils

Left: *Sarcophilus laniarius* Owen from Scotchtown Cave, N.W. Tasmania. Q.V.M.† 1953.39.2.

Right: Jaw of non-fossil *Sarcophilus harrisii* in the collection of the National Museum of Victoria, Melbourne, R 4879.

† Numbers so given are registered numbers of the Queen Victoria Museum and Art Gallery, Launceston, Tasmania

Note: In Plates VI, VII and VIII, specimens are all shown natural size.

with the bones of extinct marsupials in the Wellington Caves in New South Wales. It may be assumed that the aborigines brought the dingos to Australia, and so the aborigines can be concluded to have been here at the same time as the giant marsupials.

The dingo has not been found fossil in Tasmania and was not there when white people first arrived, but the Tasmanian aborigines readily adopted dogs from the white settlers. It is therefore inferred that the Tasmanian aborigines had no dog when they came. The association of the dingo with the mainland aborigines is the oldest record we have of the domestication of the dog. At Bushfield, north of Warrnambool, an ancient aboriginal site has been found underneath the tuff from the Tower Hill volcano (Kebie 1947, Gill 1953), and has yielded a basalt axe, flint and bone implements, and the bones of a number of extant animals, including the dingo. This means that the aborigines did see at least one volcano active in the Western District, as their traditions claim. When a landslide at Meredith in 1914 revealed a fissure two feet wide and twelve feet deep, James Hay searched among the 18 inches of fine dry red cave earth at the bottom and found the bones of dingo, kangaroo, and wallaby. In a cave at Tantanoora in S.A. (Tindale 1934), and in the aboriginal shelter at Devon Downs (Hale and Tindale 1930), the dingo has also been found fossil. Other places in Victoria where the dingo has been found fossil are the two caves on the Glenelg River mentioned earlier, Lake Bullenmerri, Colac, Gisborne, and Bairnsdale.

So the dingo has had a long and varied career in Australia. It came apparently in the Pleistocene when the climate was cooler and in many places wetter. It survived the Arid Period, and still roams many of the wilder parts of the continent, although often admixed with the breeds of dog brought by Europeans.

ACKNOWLEDGEMENT

I am indebted to the Director of the Queen Victoria Museum and Art Gallery, Launceston (Miss I. Thomson), for the opportunity of studying the Scotchtown fossils.

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REVIEW—CHECKLIST OF NORTH QUEENSLAND ORCHIDS

We have recently received Publication No. 7 of the North Queensland Naturalists' Club. First issued in 1945, as Publication No. 1, the Checklist has now been revised and expanded from eight to twelve pages, the extra four being devoted to line drawings of but eight of the 190 entities listed. Over 40 new species names appear—many for plants recently described, some for old friends under new names for reasons of priority transfer or change of rank, others being new records for North Queensland.

The compilers (Dr. H. Flecker and the Rev. H. M. R. Rupp) have recorded as a variety of *Dendrobium bigibbum* Lindl. the handsome *D. phalaenopsis* Fitz.; so also is *D. fitzgeraldii* F. Muell. lost to us by its inclusion in the species *D. superbium* Reichb. Being conservative, this reviewer is not convinced of the need for many nomenclatural changes thrust upon botanists by some specialists. What good purpose is served by transferring *diastyliflorus* from *Sarcochilus* to a new genus, *Rhinerhiza*, where it most likely always will be the one member? We had no trouble in "keying-out" *diastyliflorus* in the genus *Sarcochilus*. It would have been quite another matter if its affiliations were with an already established genus.

Possibly it is not the duty of the compilers of a checklist to accept or reject, but merely to record. This being so, they have done their task very well. If another revision is undertaken, the line drawings could be omitted and the space used to include synonymy and references to original publication. This 1953 Checklist explains the precise limits of North Queensland. Defined on the front page, the southern boundary has a definite geological and hence ecological significance. It can be inferred from the text that the northern boundary includes all the adjacent islands.

Copies of the Checklist are available from the club's secretary, Mr. J. Wyer, 253 Sheridan Street, Cairns, and the price is two shillings and sixpence.

J. R. GARNET

THE UNLOVELY SCORPION.

(A Review)

By TAYLOR RAYMENT, F.R.Z.S.

The merest novice will have no difficulty in recognizing a scorpion: the large crayfish like claws, the long tail recurved over the body and armed with a 'strong scimitar-shaped sting, are the unmistakable "hall-marks" of its ancient lineage. The details of the morphological structure are, however, not so well known, and students of the biology are few and far between; for the animals are repelling in aspect, and dangerous to handle. A sting on the flesh of one's arm or leg results in an excessive and alarming swelling with some pain, so potent is the poison.*

In the British quarterly review, *Endeavour* [12, No. 46: 80-89 (Apr., 1953)], Dr. Max Vachon, of the Centre National de la Recherche Scientifique, discusses several North African species of scorpions. The six plates, each 11 by 8 inches, in full colour, are a sheer delight for the nature-lover because of their artistic reproduction. The text-figures are faithful delineations of the anatomical structures, and reveal the author's familiarity with his subject. The colour-plates are signed by M. Gaillard, and never has the scorpion been more effectively portrayed. Perhaps the highest praise that could be offered would be to compare the paintings with those of Deimold in England.† In any case, the student is presented with a splendid opportunity to become familiar with the gross morphology and anatomy of what are sometimes described as "living fossils".

Scorpions are archaic animals; that is, they are of a primitive type which has come down through the ages. Dr. Vachon says they have remained virtually unchanged for hundreds of millions of years. They are not, of course, insects; but are closer to spiders, for the head and thorax are fused into one piece, the cephalothorax. The animals also have four legs for locomotion, a pair of front limbs armed with large powerful claws (pedipalpi) and a smaller pair, the chelicerae, which hold the prey to the mouth while the life-juices are sucked out, for scorpions cannot swallow solid food. The abdomen has seven short segments, and the tail five, plus the globular apical poison-gland and curved sting. Even the oldest of fossils are easily identified by two peculiar structures, known as the pectines or combs, which lie just behind the genital region. Rare double-tailed scorpions may still be found, and such strange forms were not unknown to the ancients. Vachon suggests that these anomalous creatures are the result of "incomplete twinning".

Australia has a number of indigenous species and, like those of other countries, they are found mostly under stones and logs and even in shallow burrows. Such a comparatively restricted habitat is, however, ubiquitous and the creatures are easily found. Moreover, they are chiefly nocturnal, and these habits are no doubt partly responsible for the success of the species.

The researcher's account (in *Endeavour*) of the development of the embryo is of special interest to biologists. "At the end of its development each embryo lies in a diverticulum, which possesses a tubular extension. This extension, almost an umbilical cord, is applied to the wall of the mother's intestine, from which it draws off nutrients by osmosis . . . we can almost speak of it as a bottle and teat process."

Fly-maggots pour out a secretion which dissolves the solids, and reduces them to a soup which is easily ingested, and digested, and adult scorpions,

* A sting from a small undetermined species, found under stones in North Gipsy land, is claimed by a lumber-feller to be the cause of a painfully swollen elbow.

† E. J. Deimold: Inimitable illustrations in J. H. Fabre's *Storybook of Insects* (Edinburgh Univ. Press, 1922. Edition de Luxe, Hodder & Stoughton).

too, have a similar habit. Scorpions eat only living prey: insects of all kinds, millipedes, spiders, and at times even larger creatures. The author believes that the pair of simple eyes are too "crude" to be of much assistance in detecting prey, and since scorpions are largely nocturnal, he suggests that certain sensory hairs (*trichobothria*) on the pedipalpi are the chief organs of detection, since they are plentifully supplied with nervures. The author uses the appropriate term, "receiving sets", for these organs.

It took a poet, Jean Henri Fabre, to describe adequately the elaborate nuptial dances of the scorpions, the *promenades a deux*, and the *arbre droit*. The nature-lover who has not read Fabre's enthralling account has yet to enjoy one of the brightest gems in the literature of natural history.

SOME BARRIER REEF SHELLS

By J. MOLLISON

[Substance of a talk given to the Club on January 14, 1952]

In May and June, 1951, I spent a very enjoyable holiday in north Queensland and saw a good deal of the Barrier Reef. I saw several Giant Clams and I would like to tell you something about them and of some cowries and cone-shells. At Green Island, 12 miles out from Cairns, I went over the reef with a party of tourists in a glass-bottomed boat. There was great excitement and many exclamations of awe and astonishment as we peered through the glass at a Giant Clam (*Tridacna derasa*), lying on the sea floor below. A full-sized specimen is over three feet in length and weighs between four and five hundredweight. The outer shell of this one was heavily encrusted with marine growth, the valves were partly open, and the rich, velvety-brown mantle was clearly visible. We were able to watch the clam feeding by means of the two large, circular apertures in the tissue between the mantles; water is drawn into one opening and, after the food it contains is sifted, it passes out through the other. The Giant Clam also cultivates a vegetable garden of algae in its tissues. Unlike the smaller clams, the Giant Clam does not appear to be common on the Barrier Reef. I saw only two full-sized specimens at Green Island, one from the glass-bottomed boat and the other I was able to walk right up to, while rambling on the reef. The latter was completely uncovered by the tide and I pushed down the soft, thick flesh of the mantle, so that I could see the pure, white shell beneath.

Horseshoe Clams (*Hippopus hippopus*) are very abundant, although less so than the Burrowing Clam. Like the Giant Clam they just lie on the reef flats, but unlike their large relative, can be picked up easily. I picked up many on the reef and each time the scalloped valves snapped shut. These clams are frequently found in sandy stretches, where there are no rocks or coral and in such cases, cowries, starfish, sea urchins, crabs and small fish gladly shelter beneath the Horseshoe Clam. There is heavy mortality among these clams. I found many empty, corroded shells and I believe that their principal enemy is a large, predatory starfish, of which I saw several. I was astonished when I first saw these huge starfish, something like a bulky cushion in shape and over a foot in diameter, but after one has been on the Barrier Reef for a while, he ceases to be surprised at anything. Another large starfish with black protuberances on its arms reminded me of a miniature mountain range. Staghorn Coral sometimes grows on live Horseshoe Clams and occasionally smothers them. The length of a full-sized Horseshoe Clam is about 12 inches and the mantle is a bright olive green.

Burrowing Clams (*Tridacna crocea*) are far more numerous than any others I saw, and more beautiful too. Their vividly coloured mantles rival the beauty of the coral itself; some are a deep blue, others blue-green or a mottled pink and green. There is a curious type of solid coral on the Barrier Reef, known as a porite, forming large round platforms usually about 5 or 6 feet in diameter. Only the outer rim—an exquisite lavender—is alive, the rest of

the platform is just hard rock. Now the Burrowing Clams seem to think that the porites were made for them: I saw at least 30 embedded in one porite. The edge of the shell is flush with the rock surface and the animal is attached to the rock through an opening in the shell. This burrowing habit gives the clams considerable protection, and I found it difficult to dislodge them. As it grows, a clam makes the hole larger, by rocking to and fro. Sometimes these clams burrow into the living brain coral; then there is a striking contrast in colours—the warm, red tints of the coral, and the deep blue or green of the clams' mantles.

Cowries are among the most beautiful and most sought after shells on the Barrier Reef, their chief charm being the brilliant polish found on the mature shell. They all have a characteristic general shape, but even so there is very great variation in size and shape, colour and pattern. Generally speaking, the smaller cowries are still very prolific, but my experience has been that the ones that reach a length of 3 or 4 inches are no longer common on the Barrier Reef. I found the white Egg Cowrie (*Amphigeras ovum*) with the animal in it at Orpheus Island, but it was the only specimen of the larger members of the family, that I saw in the natural state. The glossy white Egg Cowrie is a very beautiful shell, different in shape from most of the other cowries, and the animal is jet black. The Chocolate Cowrie (*Mauritia mauritiana*) is another large and beautiful one, and is very solid with a humped back. The pattern is very attractive with its dark chocolate base, spotted brown and cream on top. Perhaps the best known of all is the Tiger Cowrie (*Cypraea tigris*), although it is becoming scarce on the Barrier Reef. The prettily dotted pattern varies from orange and bluish-white to dark brown, and a yellow line on the back shows where the mantle flaps meet. With a brown base and snow white spots on the back, the solid little Serpent-head Cowrie (*Rapipha capulserpentis*) is one of the most beautiful species. They too are becoming scarce on the Barrier Reef, but I believe there is a small colony of them at Collaroy, near Sydney. The Arabic Cowrie (*Arabica arabica*) is still fairly common; the spotted and lined pattern on the back varies considerably, but all are easily recognized by the dark black or brown spots at the base, the red teeth and the solid shell. The Ringed Money Cowrie (*Monetaria annulus*) is still found in great numbers, the red dish orange ring adding an attractive feature to this beautiful little shell.

Cone Shells are a large and very interesting family, common on the Barrier Reef, where the five species definitely known to be poisonous all occur. The Cone's poison system is rather unusual; the animal injects a poison-filled tooth into its victim. The Geographer Cone (*Rollus geographus*) is well known for the virulence of its poison, and caused the death of a young man on the Barrier Reef in 1935. The actual shell with the animal in it has been preserved in the Brisbane Museum. The Geographer Cone has the glossy porcelain texture of the family, but, unlike some of its relatives, it is very thin, almost fragile. Many cones are solid heavy shells such as the Letter Cone (*Conus litteratus*), the black and white pattern of which is obscured by the dark, horny periostracum. The Flag Cone (*Rhysconus vexillum*), another large heavy one, is often covered by a thick white marine growth, even when containing a living animal. The well known and beautiful Cloth-of-Gold Cone (*Darioconus textile*) has an unusual and intricate pattern and is very poisonous. The smooth black and white Marble Cone (*Coronaria maemoreus*) is particularly interesting as it is not covered with a periostracum, though the beginning of one can be seen clearly at the edge of the shell. It, too, is poisonous. When handling live cones, it is best to hold them by the base of the shell, with the aperture uppermost. A pair of eyes, beautifully marked with concentric rings of various colours and situated at the end of long stalks is an odd feature of cone shells. As soon as a shell is picked up, these strange eyes come slowly out, probing about the shell, as if to see what is the matter.

A NOTE ON *NOTHOFAGUS CUNNINGHAMII*, "MYRTLE BEECH"

The nutlets form a group of three, the central one two-winged, and the lateral ones three-winged. Their arrangement can be seen by the scars in the involucre after the fruits have fallen. This is a common simple form of growth, seen for instance in winter in the leaf buds of the Ash. The English Beech has two nutlets, departing from the more primitive type. A fossil Beech has been long known in England in rocks about the age of the Fossil Beds at Mornington. Reference to Terrill's *British Plant Life* (1949) shows that it is now placed as *Nothofagus*. This supports the Southern Beeches as the more ancestral form.

The vernacular "Southern Beech" fits the *Nothofagus* group of South America, New Zealand, Tasmania and South-eastern Australia (South is not a translation of "Notho"—); "Antarctic Beech" is also used. The name Myrtle Beech for our chief species takes up an existing vernacular, but, using "Myrtle" as an adjective, indicates actually a Beech, but with some suggestion of a likeness to a Myrtle in the leaf.

In the spring of 1952, the example in my Croydon garden showed the flower arrangement cited by Bentham: new side shoots carrying staminate flowers at the lower leaves and pistillate flowers further out from the base of the shoot. In earlier seasons this placing was not observed. In 1951 there were pistillate flowers low on the side shoot, and staminate ones on older wood. Earlier still, only staminate flowers were noticed. It is possible that pistillate flowers were overlooked, but the fruits are easy to see. All these observations were made on the readily accessible lower branches.

—T. S. HART.

NATIONAL PARKS IN BRITAIN

In Britain, as in Australia, it is a grim fight to preserve sufficient land for national parks and sanctuaries, but the National Parks Commission (*Country Life*, Dec. 1952) reports that during its second year of full activity the Pembrokeshire Coast Park has been established, and the North Yorkshire Moors Park designed and confirmed. In Cornwall, Exmoor and the Yorkshire Dales parks, projects have got to the stage of consultation with Local Authorities. Joint Planning Boards are now working in those of the previously established parks such as the Peak and the Lakes, which lie in several counties and therefore come under different authorities which may have conflicting interests.

The great disappointment of the year is the lack of progress made in Snowdonia. This lies in several counties which have flatly refused to set up a Joint Planning Board, thus running counter to Ministerial instructions. This is all the more serious as the Snowdonia Hydro-electric Scheme threatens to "transform" the whole area, and it is feared that unless this park is established soon there will be left little that is worth reserving. Unless the Minister concerned now takes a very firm stand on the default action of the councils concerned, a precedent may be created which could wreck the whole scheme for national parks in Britain.

Victorians may take heart that they are not alone in the struggle. The need to preserve a beautiful countryside from the advancing tide of "progress" is felt in many countries; others, too, are having difficulty in securing their parks in perpetuity, and it is well that we, who still have plenty of land available for this purpose, should plan on a large scale, for once such land has been exploited the way of securing its release is harder, and by the time it is available again the beauty and the value to nature lovers may have been destroyed for ever.

M. M. CHATTAWAY

BOOK REVIEW

Bees of the Portland District by Tarlton Rayment, F.R.Z.S.

The bees of Portland have been very thoroughly investigated by two members of the Field Naturalists' Club of Victoria, and the resulting publication appeared on Coronation Day. The collections in the field during the three years of the investigation were carried out by Clifford Beaughole of Gorae West, and the taxonomy, illustrations and editing of the work were completed by Tarlton Rayment. It is a wonderful record for any district: one hundred and thirty-eight species of bees are recorded, of which twenty-eight are new to science. A remarkable feature is that twenty-four of the species are recorded also from Tasmania. All the plants known to have been visited by the bees are reported, and this is an unique feature.

I would commend the sentiments of the announcement on the inside of the back cover: "The Portland Field Naturalists' Club is a non-profit making society organized to foster an appreciation of the unique flora and fauna of the District. Just as Portland ploughed the first furrow for Agriculture, so the Club now publishes this booklet in an endeavour to promote the culture of the mind."

Bees of the Portland District reflects the greatest credit on the Portland Club, and reveals its progressive character, for no other district in Australia has been able to produce any publication of a similar character. The booklet has also an historic value, and copies may be obtained from the Club.

—LYNETTE YOUNG.

FEEDING BIRDS

By JEAN GALDRAITH, Tyers

Since the beginning of the cold weather in July I have been putting crumbs on a windowsill against my writing table, and have been interested in the different ways in which the birds take them.

Two Blue Wrens fly down from the nearest branch and eat as much as they can as fast as they can. The hen bird came first for two days, but the cock is always ahead now. They usually choose very small crumbs unless there are pieces of cheese, for cheese is the food most favoured by all who come to the windowsill. If there is cheese they snatch one large piece and carry it off to be dealt with in the seclusion of the shrubbery. They land direct on the sill, with no hesitation.

Brown Thornbills rarely if ever do this. They flutter humming-bird fashion above the sill for several seconds, as if to make sure there is something worth alighting for. I do not think this is precautionary so much as an exploratory examination, as I have seen them do the same thing when searching roses and chrysanthemums for aphids. Once on the "table", they eat in quite a leisurely manner, even if several people are talking inside the window.

The one Yellow Robin that comes, usually studies the food from several vantage points before landing to select unerringly the largest piece of cheese from whatever scraps may be there. If this is too big to be swallowed after being turned round to find the easiest way, he may try two or three other pieces before selecting one small enough. This is swallowed whole, sometimes with such an obvious gulp that onlookers feel a momentary sense of choking. If a large piece must be broken up, this is never done at the window, but amongst the shrubs across the path.

Two Grey Thrushes are more fastidious. They study the feast from a rear branch several feet away—the favourite vantage point of all the birds. If there is no cheese they do not come nearer. If there is cheese, it is eaten

purposefully and rather greedily, but without haste, and any large piece is carried off to the railing that supports the rose. There it is put down and deliberately pecked to pieces. Twice I was interested to see a thrush pick off a rolled leaf containing a caterpillar. On one occasion it wedged it in a splintered part of the railing, and the second time in a rose fork, before neatly extracting the contents.

A pair of White-browed Scrub-wrens, so tame that they habitually come into the house, never approach the window-sill. It is too high, about five feet from the ground, but they fare sumptuously on crumbs that the other birds spill.

Silver-eyes have been very busy amongst the chrysanthemums outside the window, enjoying black aphids, but so far are indifferent to the sugar put out for them, though one occasionally looks on while a thornbill feasts.

I have several times seen one of these adult thornbills feed the other with crumbs from the windowsill. This was on July 23, and was perhaps the beginning of a courtship.

WHAT, WHERE AND WHEN

Excursions:

Saturday, September 10—Seven-mile walk, Nyora to Lang Lang. Take 9 a.m. Yarram train from Platform No. 1 Centre, Flinders Street. Alight at Nyora. Bring two meals. Arrive back at Flinders Street, 8.45 p.m.

Saturday, September 26—School of Horticulture, Buroley. Take Burwood or Wattle Park tram in Batman Avenue. Alight at Stop No. 18. Meet at 2.30 p.m. at School gates.

Sunday, October 4—Kalamita. Subject: General. Leader: Mr. B. Jennison. Take 9.14 a.m. train to Croydon, thence bus to Five Ways. Bring one meal.

Saturday, October 10—Geology Group Excursion. Details at Group Meeting.

Saturday, October 10—180-mile parlour coach trip to Creswick. Subject: Orchids. Leader, Mr. A. Sonsee, President of Ballarat F.N. Club. Coach leaves Batman Avenue 8.15 a.m., returning approximately 7.30 p.m. Fare 17/-, bookings with K. Atkins, Botanic Gardens, South Yarra, S.E.I.

Saturday-Sunday, October 10-11—Our Club have again been invited by the Maryborough F.N. Club to spend a week-end at Maryborough. Transport, if possible, by private cars, camping facilities at Princes Park. Members desiring hotel accommodation to make own arrangements.

Group Fixtures:

Tuesday, October 6—Geology Group Meeting. Meet at Russell Street entrance National Museum at 7.30 p.m.

Preliminary Notices:

Saturday, October 31-Tuesday, November 1 (Cup Day)—Four-day private car excursion to Bairnsdale district. Can any members provide cars with caravan facilities? Leader, Mr. H. Stewart, 14 Bayview Terrace, Ascot Vale, W.2 (FU 1096). Details in last issue.

Tuesday, November 3 (Cup Day)—President's Picnic. 200-mile parlour coach trip to Cape Paterson and Inverloch. Coach leaves Batman Avenue 8.15 a.m., returns 8.30 p.m. Fare 22/-. bookings with K. Atkins, Botanic Gardens, South Yarra, S.E.I.

KENNETH W. ATKINS, Excursion Secretary.

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PROCEEDINGS

At the General Meeting held at the National Herbarium on September 14, Mr. A. A. Baker presided and about 150 members and friends were present. A special welcome was extended to Miss Jean Galbraith, our well-known Country Member from Tyers, Gippsland.

The President then introduced the speaker for the evening, Mr. S. R. Mitchell, who took those present on a tour of North Africa and gave his impressions of that country gained during his visit to the Geological Conference held at Algiers last year. The address was well illustrated with pictures of places visited. Mr. Cobbett thanked Mr. Mitchell on behalf of the Club. The context of the talk may be read elsewhere in this issue.

The President discussed the forthcoming show prepared in Tye's gallery, and Mr. Wakefield informed members of several aspects of the Australian Nature Show to be held in the Prahran City Hall in October.

It was announced that Miss Kurth had resigned from her position of Assistant Secretary, and Mrs. Lewis from that of Exhibits Steward. Volunteers are requested to fill these positions.

The Secretary announced that Dr. Wettenhall had sent a donation of one guinea to the Club's funds.

The President referred to the fact that our Treasurer, Dr. Geroe, was leaving shortly for England and would be absent for about four months. He expressed best wishes and *bon voyage* on behalf of the Club. During the absence Miss Butchart will act as Treasurer.

After several exhibitors had commented on outstanding points in connection with their specimens, the meeting was adjourned at about 10 p.m. for the usual conversazione and inspection of exhibits.

GEOLOGY DISCUSSION GROUP

The September meeting was held at the National Museum, 16 members being present. Mr. Baker gave an account of a Group Excursion on August 15, when the survey along the Darebin Creek was extended over a further section. The subject for the evening was a talk by Mr. A. A. Baker entitled "Fossil Invertebra—Their Life and Form—Arthropoda Part I." This dealt with Branchiopoda, Ostracoda, and Cirripedia. A description of the animals, the geological history, and ecology, was given with the aid of lantern slides and specimens.

NATURE NOTES AND EXHIBITS AT SEPTEMBER MEETING

Geology:

Sections of slates from Bendigo, showing graptolites, and staining from pyrite crystals—Mr. Baker.

Conchology:

Olive Shells, representing the genus *Oliva*, a very popular group of beautifully marked and naturally polished marine shells—Mr. Gabriel. The exhibitor commented that he would be interested to receive a local specimen of the one species recorded for Victoria. It is well-known further west, but he has not collected it in this state during 40 years' experience.

Shells from Barrier Reef and Cowes—Master Ronald Tremewen.

Barrier Reef shells, from Dunk and Orpheus Islands, brought back by Mr. and Mrs. Lewis after their recent visit to Queensland tropical waters.

Botany:

Coral Lichen, *Cladonia retipora*, from the Bendigo Whipstick area—Mr. Baker.

Pseudanthus ovalifolius, *Westringia glabra*, *Phacelium obcordatum*, *Lepidomeria aphylla* and *Casuarina muelleriana*, all from the Bendigo Whipsticks—Mr. Stewart.

Greenhood Orchid, brought back from Papua by Messrs. Semple and Rayner who recently ascended the 15,000 feet Mount Wilhelm in New Guinea—Mr. Garnet.

Garden-grown native flowers, *Grevillea olivoides* and species of *Acacia*—Mr. Jennison. These flower better under dry garden conditions than they do in their natural habitats.

"Rock Lily," *Dendrobium speciosum*, Victoria's largest orchid—Mr. Miller. These plants were collected about 20 years ago at Genoa in East Gippsland, where they are severely cropped by wallabies. They flower profusely each alternate year, responding well to complete lack of cultivating.

Philonotis tenuis, a normally sub-antarctic moss found by Mr. Rieschick in a shaded gorge of the Macdonnell Ranges in Central Australia.

Miscellaneous:

Photographs of wild animals in the Kruger National Park, South Africa: and two albums containing South African butterflies and succulents—Miss Gwendoline Neighbour.

OBITUARY

The death is recorded, with regret, on July 24th last, of Mrs. L. A. Cochrane, of Sandringham, a member of the Club for some years. Until failing health of recent months prevented her, Mrs. Cochrane consistently attended the various activities of the Club. She evinced keenest interest in natural history, especially on field excursions, where her bright personality made her always welcome. Her metier was birds, which accounted for her being an enthusiastic member of all the societies in Melbourne concerned with the study of bird life.

IMPRESSIONS OF NORTHERN AFRICA

By S. R. MITCHELL

[Address to the Club on August 10, 1953]

The Nineteenth International Geological Congress was held at Algiers in September, 1952. The writer was fortunate enough to attend and to join a pre-congressional tour of ten days duration. The tour commenced at Marseilles, where 350 members of the Congress embarked for Tunis on the S.S. *Champaillon*. This ship, a fine vessel of 12,500 tons burthen, was unfortunately wrecked on the Lebanon coast a few weeks later. Two days were spent in colourful Tunis; the ship then moved from port to port during the night, stopped at Biserte, Bone, Phillipville, Djedjelli, Bougie and Oran, thence travelling back to Algiers. In the daytime long tours were made inland, by bus, enabling the party to see much of the country and study the geology of this part of Northern Africa.

Several days were spent by the writer in Marseilles, the second largest city in France, and founded by the Greeks in 600 B.C. Situated on a narrow coastal strip and on the foothills of the mountain range, it possesses a small natural harbour, the "Vieux Port", seventy acres in extent. An old fort stands at the entrance and is now surrounded by tall buildings and modern cafes. The safety of this harbour for the small vessels of older times was probably the reason for the settlement. The modern port has a long breakwater built parallel to the shoreline for protection of shipping. As there are very few natural harbours in the Western Mediterranean, particularly on the African coast, most of those now in use have such artificial breakwaters as that of Marseilles.

On approaching the city one first sights the high mountains which skirt the French and Italian Riviera, then some small rugged islands of hard grey limestone, and the well known *Château d'Iff* made famous by Alexandre Dumas. Marseilles is well laid out, with many fine boulevards and squares, lined with magnificent thick-barked plane trees growing to a height of sixty feet or so. Looking down on the city from the hill on which is the church of Notre Dame de la Garde, the streets are well marked by the green foliage of these trees.

Tunis, situated on the Bay of the same name, is a modern city, the capital of the French dependency of Tunisia, which was taken over in 1881. A few miles away are the ruins of ancient Carthage. Within the city is the old walled Arab town, notable for magnificent mosques, the remains of the aqueduct that conveyed water to Carthage, as well as a fine museum and shopping centre. The old aqueduct is constructed of arches of limestone, to carry the water channel. Some of the arches are 50 feet in height, and portions of the structure may be seen for many miles inland.

The museum houses a large number of remarkable mosaics recovered from the ruins of Carthage and other ancient cities. These mosaics are set up on the walls, where they may be closely examined. They are made of innumerable pieces of coloured stone set in a lime cement, to form intricate and beautiful designs—veritable pictures in stone—some of which may be compared to modern floral carpets, yet it is doubtful if modern artists in any media capture those glorious effects of past masters. One outstanding example, originally the floor of a swimming pool, depicts marine life in various forms—sharks, porpoises, crabs, octopi, fish of several species and large shell-fish.

There are also a number of very fine bronze and marble figures, recovered from the ancient harbour. The story is that these relics were part of the

cargo of a ship, which, carrying goods from Greece to Carthage, was sunk, covered with mud, and so preserved. In 1912 the remains of the old vessel were located by fishermen, and the treasures now to be seen in the museum at Tunis are in such splendid condition that it is difficult to realize their great antiquity.

The ruins of Carthage hold much of interest. Carthage was founded in 700 B.C. by the Phoenicians, a Semitic people from the east coast of the Mediterranean, north of Palestine. Seafarers and traders, they formed settlements in Spain, Corsica and Malta, and probably visited Cornwall for tin. The Carthaginians, as they were called, became dangerous rivals to the Romans. After three wars Carthage was captured and destroyed by Scipio in 146 B.C. Of its then population of 700,000 people, a large proportion was massacred, the others being made slaves. That Carthage must have been a prosperous city is evidenced by the ruins of the Forum, several fine temples, an open air theatre and large water cisterns, all showing damage done by the Romans.

During the Roman occupation of North Africa many cities were built and a number of them have been excavated and restored by the French. Some are still covered by the sands of the Sahara. After the decline of the Roman Empire, Vandals crossed over from Spain and conquered the country, they in turn being defeated by the Arabs in 698 A.D. Northern Africa then came under Turkish rule, and finally under the French.

The North African region which extends from Tunisia to Morocco, is characterized by two mountain ranges, the Lesser Atlas which skirts the coast and the Saharan Atlas to the south. Separating these two ranges is a broad belt made up of tablelands, highlands and ravines. Further south the country rapidly becomes more arid, merging into the Sahara. This far-famed desert, the largest area of arid land in the world, consists of sandy and stony stretches, mobile sand dunes, low-lying depressions, and occasional oases on which the date palm thrives.

Much of the undulating country of the coastal region is under cultivation. The climate is warm, and in parts there is a 40-inch rainfall. The French have planted large areas of vines, and have cultivated olives, although the olive appears to be indigenous, growing wild on the hills. Cork-oak forests cover much of the poorer hilly country. Figs, oranges, tobacco, cotton and rice are among the crops grown, while further inland wheat, oats, and barley are produced in large quantities. It is easy to realize that two thousand years ago this part of Africa was regarded as the granary of Rome. A railway system connects the principal cities along the coast and inland with various centres; there are also excellent highways.

Some of the mountainous regions, such as the Tell Aures, reach a height of 11,000 feet, and are snow-covered in winter. The geological structure is of great interest, being chiefly a complex of Cainozoic and Mesozoic rocks, with some Palaeozoic formations, which in places are much metamorphosed and with numerous granitic intrusions. There are some areas of volcanic craters, lava flows of basalt, volcanic plugs and dykes of phonolite; these last having been exposed by denuding agencies. Limestones and marbles occur in many places: and were largely used by the Romans in the construction of the cities in this country.

It was very pleasing to an Australian to see that our eucalypts have been planted extensively along the railways and highways. In a different environment they seem to have changed their habit: the leaves are longer, thinner and of a much lighter colour than is the case in their natural habitat. One blue gum was noted with a diameter of at least 30 inches near the ground. Botany Bay fig trees, currajongs, acacias and the salt-bush were also noticed in various places.

The people of these countries are chiefly Arabs. There is a small proportion of Kabyles of Hamitic origin, with the darker Berbers in the south. The Arabs who are Mohammedans, live under squalid conditions in the cities and in mud huts in the country. The nomadic Bedouins dwell in flat tents of felt, with their following of camels, sheep and goats. Grain is still separated in the old eastern way, with donkeys treading on the straw, which is broken up during this process. It is then built up into long stacks and covered with mud to prevent its being blown away by the wind.

After leaving La Goulette, the port of Tunis, the next stop was Bone, a small town, well laid out, with one wide tree-lined boulevard and many fine buildings. A visit was made by electric railway to the l'Ouenza iron ore deposit, some eighty miles inland. Good quality ore, mostly hematite, is quarried there, the present output being in the region of 2,000,000 tons per annum. Much of this is shipped to England. This deposit was exploited by the Romans. Close to Bone is the Cap de Garde, a high rocky point overlooking the Mediterranean, and with a magnificent view of the coast. A narrow pathway has been cut in the face of the steep cliff; to provide access to the lighthouse.

The ruins of Hippone, also in the vicinity of Bone, are most imposing. These include the remains of what must have been very fine villas, with handsome marble columns, a theatre, thermal baths, an aqueduct and several temples. On the paved floor of the forum is a monumental inscription to Gracius Africanus, obviously an important personage of his time, but unknown to present day historians. Another notable relic is a large marble head of the Roman Emperor Vespasian. Some indication of the engineering ability of the Romans is given by the fact that most of the ancient cities in Africa possessed both water supply and sewage system.

From Phillipsville, the next port of call, a visit was made to the picturesque city of Constantine, some 50 miles to the south. From Constantine, which is situated on the summit of a mountain of limestone, can be seen a remarkable panorama of the surrounding country. A deep gorge divides the town into two parts, linked by suspension bridges. Well paved streets, a spacious square and modern buildings give the impression that portion of Paris has been transported to Africa. On the lower slopes are the crowded dwellings of Arabs and Berbers, roofed much in the same manner as in Roman times. The approach to the town is marked by a magnificent marble arch on the edge of a steep cliff, a most artistic and impressive war memorial.

West of Constantine are some ancient snail-shell middens, inhabited by man 15,000 years ago. These have been excavated and studied; and an interesting fact is that large numbers of the small flint artefacts that have been recovered are identical in form with those made by the Australian aborigines.

On the return journey some time was spent at the headquarters of the French Foreign Legion; this consists of a fine series of buildings, with a historical museum and many relics of interest. From Bougie, the next port, Cap Carbon was visited. This is part of the coastal range bordering the Mediterranean. It is made up of highly resistant metamorphic limestones and schists, and rises steeply from the sea to a height of 2,000 feet.

The famous ruins of Djemila, among the finest in Northern Africa, comprise the remains of a large forum, several temples, a theatre, market place, water fountains and baths. White marble has been used extensively for paving, as well as for the construction of several fine arches and innumerable columns. In the city, which was founded in the second century A.D., are the remains of fine villas, a great contrast to the small rooms and shops facing narrow streets, in which the poorer classes lived. Although the walls are not now very high, the living conditions of people of those times may easily be visualized. Inland from Bougie the French have built a large barrage for

the conservation of water and a hydro-electric power plant. The highway follows a remarkable gorge (Gorge de Kenuata) which traverses the *Chaîne des Babors* where some of the rock faces are 1,000 feet high.

Oran was the *Cromwellian's* most westerly port of call. It was at this small port, about 220 miles west of Algiers, that some of the French fleet was sunk to prevent the vessels falling into German hands. Remains of some of the wrecks are still to be seen. A short trip was made to a sea-side resort, where members of the Congress had an opportunity to bathe in the warm and very saline waters of the Mediterranean.

From Oran the ship then proceeded to Algiers, the capital of Algeria. A very fine city, spread over several miles of hillside, Algiers possesses an excellent water-front, many wide streets and tree-lined reserves. The French section is remarkable for its cleanliness and for the great number of six or seven storied buildings. In the centre of the city is a wide reserve consisting of a series of terraced gardens. There is a well designed memorial, and a large paved area fronting the dignified Government buildings, over which the French tricolour flies.

On the heights is the old fort which the French stormed in 1830, when they took over Algeria. Prior to this time this coast, known as the Barbary Coast, was notorious for the raids made on shipping by the Arabs. On the summit, offering a magnificent view over the Mediterranean, the people enjoy the amenities of a swimming pool, a sports ground and a children's playground. These pleasuregrounds throw into sharp relief the Casbah, the Arab quarter, in which Arabs, Jews and Nubians live in squalor.

The Casbah, on the slope of the hill, is traversed by narrow passageways and mean streets, all very dirty and smelly. Some of the houses have several storeys, but the rooms are small and unattractive. Many of the shops, housing bakers, butchers, shoemakers and metalworkers, measure not more than six feet square. The men vary in color from white to black. They wear white shorts and shirts; and the women, with faces covered to the eyes, are also garbed in white.

The Geological Congress, held here last year, was well organized by the French, and was attended by delegates from over seventy countries. Much interest was shown in the writer's talk, supplemented by a range of specimens, on the stone and wooden artefacts of the Australian aborigines. Questions were asked in a number of different tongues; but, with the help of French, Italian and German friends, as well as that of the able Dutch chairman, the language barrier was overcome.

MORE NOTES ON FEEDING BIRDS

During the two weeks since I sent some notes on birds' feeding habits when they came to my window for crumbs, I have realized that I was mistaken in supposing that the fluttering of Brown Thornbills before alighting was not an indication of lack of confidence. The Brown Thornbills are now so confident that they fly straight across the garden, alighting on the window-sill without the slightest hesitation or fluttering.

However when I placed cheese crumbs on my hand resting on the sill, instead of merely on the window-sill, the thornbills fluttered above it, as they had done at first above the window-sill, but were sufficiently confident to alight momentarily on my hand and snatch cheese, although the Blue Wrens which had originally been more confident than the thornbills would not take anything from my hand. They did alight on the window-sill beside it, and took crumbs from there. As this experiment was tried for the first time to-day, I have little doubt but that both birds would soon be as ready to take food from my hand as from the window, if I could spend half an hour or so accustoming them to the new arrangement.

—JEAN GALBRAITH, TYERS.

LYREBIRDS AS "PETS"

By A. H. CHRISTOLM

Although a considerable body of useful information regarding the Lyrebird was given in the *Victorian Naturalist* last year (September, 1932), the group is so remarkable that much more could be written without exhausting the subject.

The story of white men's first contacts with the bird, for example, is involved and fantastic. Another facet of interest relates to the keeping of specimens in captivity or in a state of semi-domestication. A summary of this latter phase of the subject may be given here. It concerns experiences in Australia, England, and France. The United States of America has in recent years out-distanced other countries in obtaining examples of Australian fauna—notably the platypus and koala—but, so far, it has never gained a specimen of the Lyrebird.

The pioneer keeper of Lyrebirds was J. E. Wilcox, a zoological collector who operated mainly in the Richmond River region of New South Wales. There, in 1832, he took from nests four fledglings of the then newly-discovered Prince Albert Lyrebird and tended them successfully (using worms, insects, bread and meat as food) until they were about six months old; then he lost all four in a bush fire.

Soon after that, attempts were made in the Latrobe Valley, Victoria, to rear young Superb Lyrebirds with the aid of domestic fowls. Details of this experiment are lacking; it is merely mentioned, in the *Transactions* of the old Philosophical Institute of Victoria (in 1858), by J. W. Beilby, who adds that the attempts "succeeded sufficiently to induce further efforts, with greater care for the safe custody of the chicks." In the same decade a fledgling was kept for eight days by Ludwig Becker, a Melbourne medical man. Dr. Becker, an Australian acquisition from Germany, had appointed himself a kind of publicity manager for the Lyrebird, and he gave John Gould (See *Handbook to the Birds of Australia*, 1865), some informative notes regarding his "young captive." Also, he expressed the opinion that Lyrebirds "could be shipped to England with as little difficulty as any other Australian birds, none of which, however, offer such attractions as the *Mourea*."

A few years later (1863) the first Lyrebird to leave its homeland in a living state arrived at the London Zoo from New South Wales; that unfortunate pioneer, a male bird, died within a few days. Two further specimens acquired by the same Zoo, in 1867-8, lived a good deal longer (they were fed mainly on finely-chopped meat, earthworms, and meal-worms), and the one first obtained, an immature male, became the subject of an enlightening article by the Superintendent of the Zoo, A. D. Bartlett. His chief points were three in number—a tribute to the gentle nature of the bird (the same comment has since been made in Australia); a reference to the fact that the captive could move very quickly and also jump "almost incredible distances" and a gasp of surprise at the bird's ability to drag about clods of earth and roots upwards of 7 lb. in weight. (See *P.Z.S.*, London, 1867, pp. 688-9).

The next experiment of the kind appears to have been one centring on a pair of birds which, having been reared by a settler in the Hawkesbury district of New South Wales in the 1890s, were bought by a Frenchman and—accompanied by 20,000 earthworms obtained by advertisement—were shipped to France. The female, it is reported, died from the effects of the heat while passing through the Red Sea, but the male lived on for about five years in a Zoo in Paris.

At the present time there are no Lyrebirds in captivity outside Australia, but several are held in Zoos and "Switzerland" in this country. None of

these captives, whether paired or single, is revealing any hint of the spectacular achievements they are capable of producing in a state of freedom.

In point of fact, people lacking personal knowledge of Lyrebirds, but who have heard of their reputation for beauty and song, are often disappointed at seeing a brown-bodied and silent bird in a Zoo enclosure. Last year, for example, a woman who was peering into the Lyrebird aviary at the Adelaide Zoo asked a keeper to direct her to the bird. She was told that the exhibit was standing a few yards away.

"Nonsense!" said the visitor. "I've seen the Lyrebird on a postage stamp, and it has a large tail erect over its back. What's more," she added triumphantly, "that bird is plain brown, and the Lyrebird on the stamp is green!"

Incidentally, not one of the Zoos of Australia (which in general are notoriously inefficient in compiling zoological data), has ever put a useful fact regarding Lyrebirds on record. Aside from a few notes made by David Fleay, some years ago, on a pair of *Menura* at the Healesville Sanctuary, the only material results obtained from Lyrebirds in captivity, or in semi-domestication, are those to the credit of examples named "Jack", "James", "Joe", "Zoe", and "Pat", all of which were associated, not with Zoos, but with private persons.

Jack was a domesticated bird that lived for about twenty years (from 1885) on a farm near Drouin in Gippsland; he distinguished himself by learning to reproduce the human voice. (See *The Emu*, 5: 33, 1905).

James was a wild bird that became by chance a frequent visitor to the cottage of Mrs. Wilkinson, at Ferny Creek, in the Dandenong Range of Victoria; a handsome fellow, he was admired by many visitors from various countries over a period of years, and, perhaps inevitably, he was made the subject of many extravagant statements.

More importance attaches to Joe and Zoe, Lyrebirds taken as fledgelings, in 1927, by Jack Coyle of Springwood, on the Blue Mountains, and tended so successfully (with governmental permission) that they eventually established a record by breeding under aviary conditions. Zoe first built a nest and laid an egg at the age of five years, but after twelve days she gave up brooding and destroyed the egg. Later—at the age of nine years—she brooded an egg for the orthodox period of six weeks and then delighted all concerned by producing a chick. The newcomer was named "Pat", mainly, no doubt, because Jack Coyle was hazy about certain aspects of baby Lyrebirds and so gave himself a choice between Patrick and Patricia.

All three of those engaging birds died prematurely: Pat met with a fatal accident; Joe died from shock soon after a bush-fire approached his quarters, and Zoe pined away within a few months of losing her mate. It was a sad ending to a notable association. Joe and Zoe had been together for fifteen years.

Further to the matter of the impact of the white man on Lyrebirds' behaviour, there are reports to the effect that these distinctive birds have sometimes fallen from traditional grace to the extent of interbreeding with domestic fowls. A. W. Milligan, a competent ornithologist of other days, has claimed that he placed hybrids between the common fowl and the Lyrebird on view in Melbourne in the 1890s, and a report from the Two-fold Bay district, N.S.W., referred to similar hybrids: they were said to have been fathered by fine Lyrebird that visited a bush farm, and were described as being wild chicks with more resemblance to the male than the female parent. (See *Vie. Nat.*, June, 1946 and January, 1948).

These reports are puzzling. Although the Lyrebird was supposed long ago to be gallinaceous, it differs anatomically and in various other respects (including tastes in food) from the fowl, and if interbreeding occurred between the two groups the occurrence would be, to say the least, quite extraordinary.

PLATE IX



"Joe" (on arm) and "Zoe", the pet Lyrebirds, seeking worms from a tin. The smaller girl is an American, the other an Australian.



"Joe" at close range. He often perched on a visitor's arm, and the enjoyment was mutual.

In any event, hybrids among birds are rarely uplifting sights, and certainly no one should desire to see evidence of promiscuity on the part of the Lyrebird.

Here is a creature of ancient lineage and high tradition, and one whose habits of nesting-time, on the part of both sexes, give it rank among the most distinguished birds of the world. Australians, therefore, well may hope that family life in this remarkable group will continue in its normal course, and that the birds will remain for all time, as they are now, a very charming feature of their own particular bushland.

NOTES ON AUSTRALIAN MOSQUITOES

By N. A. WAKEFIELD

At the August meeting of the Club, Dr. Clunies Ross made some interesting comments on the part played by the mosquito *Anopheles annulipes* in spreading the rabbit plague, myxomatosis, in Australia. The compilation of data in connection with this disease, mainly by officers of the C.S.I.R.O., has added much to scientific knowledge of the habits of the mosquitoes of south-eastern Australia, just as the consideration of malaria during the war years stimulated similar research in more northern areas. Much of the resultant information has been published in various scientific journals, by experts in the field of entomology, and the following notes are presented here for the less scientific naturalist, as a brief glimpse into a very intriguing subject.

Mosquitoes are of necessity most interesting because of their activities in transmitting numerous diseases, but, while one species may act in this way, other closely allied ones may not. *Anopheles annulipes* is the common member of its genus in Victoria and is quite widespread in Australia. Neither this species nor the more northern *A. omicrus* are malaria carriers*, so that disease did not become prevalent among residents of extra-tropical Australia even after the return of many infected soldiers during the past decade. A notorious carrier, *A. punctulatus*, ranges into tropical Australia south to about the latitude of Cairns.

Aedes aegypti, a noiseless speckled mosquito, common about houses in the Brisbane area, is responsible for the transmission of Dengue Fever, a mild illness of about a week's duration. Members of the Aedine sub-genus *Stegomyia* spread Yellow Fever in other parts of the world, but so far the Australian species of the group have fortunately not been tested in this capacity.

Culex fatigans, which breeds in unclean stagnant water from domestic drainage and often assumes plague proportions in the environs of Sydney, transmits a very prevalent but apparently harmless form of filariasis. The parasites which infect the blood in this case come to the small vessels near the skin only at night, which links with the wholly nocturnal habits of the particular mosquito.

In contrast with the well-known clusters of "egg-rafts" of the Culicine species, the eggs of *Anopheles* float singly on the water. The larvae are surface feeders and may be seen resting horizontally along the water or moving across it with a characteristic jerky motion. They avoid diving except when it is necessary for safety. Very little water is needed, and in New Guinea fully developed larvae and pupae were often seen in the tiny pools in wheel ruts and even in the depressions left by soldiers' heels in muddy places.

In cases of food shortage in small quantities of water, stronger larvae eat others. This tendency was illustrated near Brisbane in 1943 when members of different species were collected into a single tube. Very soon some of the specimens disappeared, and it was noted on that occasion that the Anophelines

* At least up till 1942 there had been but a single known case of malaria for which *Anopheles omicrus* was evidently to blame, for the victim had never been further north than Bundaberg, Queensland.

succumbed to the Cullitines. Cannibalism must be a general rule with mosquito species which habitually deposit several 'egg-rafts' each of about 200 eggs, in tiny pools containing a pint of water or less.

The time needed for the emergence of the adult insect is often as little as 10 days after the laying of the eggs, and the adults can live for at least several months, "hibernating" in sheltered places when necessary. Therefore very little occasional water will ensure the survival of a mosquito population.

A C.S.I.R.O. report, in *Nature* (July 5, 1952), links the myxomatosis "run" of the summer of 1950-51 with the abundance of *Culex annulirostris*, while the spectacular spread of the disease a year later, over one-third of Australia, is coupled with the widespread appearance in great numbers of *Anopheles annulipes*. The latter is reported to have a marked preference for the blood of rabbits and to inhabit their burrows, even in dry areas.

In many desert parts of Australia, the presence of rabbits is reputed to depend on their access to subterranean water. There is therefore a possibility that in some cases the mosquitoes might utilize similar water for breeding.

Anopheles lacks the familiar noisy hum of many other mosquito species and also their irritating sting. It is a silent flier and its attack is usually painless and passes unnoticed. Moreover, it avoids daylight and is mainly nocturnal in its habits. On one occasion the writer was attacked by some *Anopheles* in the daytime, but this was in the gloom of a dense "jungle" rain-forest on Mount Cooroy in south-east Queensland. The offender was the large *Anopheles bancrofti*, not a disease carrier, but with thick dark palpi giving it a formidable beaked appearance.

In New Guinea, during a year in an area where larvae of *Anopheles* were much in evidence, the writer was only once aware of being bitten by an adult of the genus. Many soldiers who contracted malaria did not know themselves to be bitten at all, and a number of casual observers have expressed the opinion that mosquitoes were not present in certain areas reached by myxomatosis. However, there are strong grounds for assuming that mosquitoes can survive in any area where rabbits can exist.

Though *Anopheles annulipes* might neglect humans when the rabbits which it prefers are available, it will at times readily turn to human blood. At Noble Park near Melbourne, just at dusk one warm evening in March last year, great numbers of this species were in evidence, as many as a dozen at a time landing on one's arms. They "stood on their heads" in the unmistakable *Anopheline* attacking position—proboscis, body and light-grey speckled wings aligned almost at right-angles to the surface of the skin, held there by extremely long slender legs.

One of the outstanding features of the 1951-52 summer spread of myxomatosis was the appearance of several outbreaks each far distant (anything up to 50 miles) from the nearest known infected areas. In considering this, it is interesting to recall instances of the migration of mosquitoes, evidently with the aid of prevailing winds, for long distances from their breeding places. The northern *Aedes zigzax*, a fierce little black biter of the coastal scrubs, breeds by preference only in brackish water, but has been reported at Too-woomba in south-east Queensland, about 80 miles from the coast. Its Victorian counterpart, *A. camptorhynchus*, which is exactly similar in its habits, often appears, following favourable winds, in quite plague proportions many miles inland, only to die out eventually for want of suitable water for breeding.

Perhaps the most remarkable mosquito breeding place is in the fluid of *Nepenthes*, the Pitcher Plant. About a score of *Culicine* species are believed to lay their eggs nowhere else. On one occasion in New Guinea the writer was able to observe this partnership. Each open "pitcher" contained about a dozen larvae which were not only able to resist sufficiently the digestive properties of the liquid, but shared with their carnivorous hosts the proceeds of these "death-traps" in which they lived.

BOOK REVIEW

Australian Plants for the Garden by Thistle Y. Harris. 10m. x. 7½in., pp. XIV-354, pls.: 5 col. 32 half-tone Angus & Robertson, Sydney 1953 63/-.

Australia is richly endowed with a magnificent and colourful flora, which is far too little appreciated by her laity. Unquestionably, an important reason for the neglect of Australian plants by Australian gardeners, during more than a century, has been the lack of any text-book devoted entirely to these natives—a reliable and handy guide to the more ornamental species for various environments, what they look like, and how to propagate and care for them in the garden. Nurserymen stock no more than a few hardy indigenous kinds, simply because there is little demand for others: but good, authoritative and popular literature would foster public interest and aid in creating such a demand.

The challenge has been accepted by Thistle Y. Harris, lecturer in Biological Science at Sydney Teachers' College, who is well known by her book *Wildflowers of Australia* (2nd ed. 1947) and who is eminently qualified to write appealingly and helpfully about the horticultural merits of our native flowers, trees and ferns. So we welcome the splendid, most attractively illustrated volume which has just appeared in consummation, as it were, of her enthusiasm. *Australian Plants for the Garden* worthily upholds the Angus & Robertson tradition for good typography, pictorial reproduction and general arrangement of subject matter.

Twenty-three well poised chapters adequately treat such subjects as the planning of a garden, propagation technique, diseases and their control, small home gardens, trees for parks and avenues, hedges and windbreaks, ferns, climbers, and plants suitable for the rock garden, water garden or window box. The derivations of scientific names form an appendix, and special planting plans (each with lucid diagram) are formulated for 17 types of garden, varying with soil, climate and specific needs. A full index of genera, species and vernacular names closes this book which is a "must" for all patriotic Australian horticulturists who can afford three guineas—they will not be disappointed with the outlay.

The pages (2-20) on garden planning are full of wisdom, especially the plea for naturalness and harmony in fencing, adornments and paths; red ironstone gravel is recommended as ideal cover for garden walks, being soft to the eyes and a familiar natural feature of our sunny land. The chapter on preparation of soil, bearing in mind its physical and chemical nature, is instructive; so are the numerous diagrams which explain the treatment of seed and seedlings in the nursery stage. Then there are detailed accounts of planting out, staking, pruning, mulching, propagation by cuttings or grafts and plant breeding. A worthy selection of species is made from the whole Commonwealth for adaptation to differing garden requirements, and the essential feature (appearance, flowering season and habitat) of each plant are succinctly described. There are surprisingly few typographical errors among the hundreds of scientific names employed.

One would prefer to conclude without a word of adverse criticism, but there are some disturbing blemishes which call for mention. The adaptability of several handsome native trees has been amply tested, yet one looks for these in vain among the author's lists. Two in particular spring to mind—Red Ironbark or Mugga (*Eucalyptus sideroxylon*) whose massive, deeply fluted black bole is the personification of rugged strength, contrasting delightfully with silvered foliage, and Tamar Cypress-pine (*Callitriche oblonga*) which, in its trim erect habit, has very dense branching and bluish aspect stands in the very forefront of desirable subjects for a big hedge. In reference to "Wattle Hedges", should it not be stressed that cutting is

usually inimical, and exposure of the wood in many *Acacia* species is an invitation to disease-producing organisms? Why is Spotted Emu-bush (*Eremophila maculata*) advocated for hedges in arid areas? Experience has proved this beautiful shrub to be notoriously poisonous to stock, so surely there is need for due warning against its cultivation where cattle or sheep are at large. The colour plate of N.S.W. Christmas Bush (opp. p. XIV) is pleasing, but one could wish that the cardinal glory of Sturt's Desert Pea (opp. p. 51) had been photographed against a pale contrasting background instead of a depressing, smudgy wine-purple.

More serious are the factual errors in nomenclature and derivation of names. Of 80 different species figured, 11 have been mis-identified, e.g. the plant called "*Brunonia australis*" (opp. p. 146) is in reality a *Pinetela*, "*Hakea leucoptera*" (opp. p. 242) is undoubtedly *Grevillea leucoptera*, "*Eucalyptus tetragona*" (opp. p. 259) is referable to *E. tetraoptera* and "*Melaleuca thymifolia*" (opp. p. 227) to *M. pulchella*. It is regrettable indeed that the titles of the pictures were not carefully checked before publication, for the incomparable photographic work of Mr. H. T. Reeves has contributed so materially to the usefulness and selling value of the book; it is desirable that an *errata* slip be printed now for insertion inside the cover. *Tieghemopanax* is spelt correctly in the appendix, but appears as "*Tieghemopanas*" elsewhere.

Coming to the derivations, too many epithets, like *rubroides*, are attributed to "*Rubia* = a kind of plant": why not be definite, citing "from *Rubia*, the madder, *Toxus*, the yew, or *Ulex*, the gorse", as the case may be? That ridiculous legend about *Chorisma* ("from *choros*, a dance, and *sema*, a drinking-vessel") is perpetuated on p. 292, although consultation of Labillardiere's published journal (1800) makes it quite clear that this new genus of pea-flower was named from *chorizo*, to separate, and *nema*, "thread"—in allusion to the free and distinct staminal filaments. The epithet *aliceae* derives from the Grand-duchess Alice of Hesse (a daughter of Queen Victoria), not from "Alice Springs"; likewise *victoriae* commemorates Queen Victoria, not the Victoria River. The epithet *comptoniana* honours a family name (Compton) of the Marchioness of Northampton who introduced *Hardenbergia comptoniana* to English gardeners at the beginning of the 19th century—it has nothing whatever to do with the Latin word *comptus*, "neat" or adorned (as stated). J. Basisto was not a Victorian botanist, but a manufacturing chemist; W. Ferguson, Inspector of Forests, was in charge of landscape work at the Melbourne Botanic Gardens for a short period, but was never Superintendent (as stated); Sir Thomas Mitchell was better described as Surveyor General and a distinguished explorer than a "nineteenth century botanist", while Sir James Edward Smith never botanized in Australia, as implied.

Halmaturina signifies Kangaroo Island, not "salt-loving", and *halicecubum* is literally a "red earthen salt pot" (in Greek)—the name was fittingly applied to the decorative angular fruiting calyces of the American Strawberry Ground-cherry (*Physalis alkekengi*), not a "nightshade". *Melissifolia* denotes balm-leaved (not "honey-leaved"); *nesophila* is island-loving (not "river-loving"); *oroboides* means like the genus *Orobis* (not "orb-like"); *radiata* means radiating, like the spokes of a wheel (not "shining"); *scabra* and *seabra* (gender forms) mean precisely the same thing, viz. rough or scurfy. So one could go on; but enough has been said to show the need for scrupulous accuracy in a list of name derivations—if they are to serve any good purpose at all.

Let us hope there will be future editions of *Australian Plants for the Garden*, and that all irritating imperfections may be eliminated from such a praiseworthy addition to our botanical literature

—J. H. WILLIS.

THE ARCHIPELAGO OF THE RECHERCHE—Part 3, Plants; and
Part 4, Mammals.

(A Review)

A further instalment of the full Report of the Australian Geographical Society's Expedition to the above Islands has been issued, and is now available, price 5/- per copy.

Part 3 takes in the Land Flora, inclusive of the Vascular Plants and Cryptogams, for which Mr. J. H. Willis is responsible, whilst his collection of the Marine Algae, probably the first made from the area, was referred to Mr. H. B. S. Womersley, who sets these out systematically, with a brief foreword.

Mr. Willis covers his domain comprehensively, first outlining the history of exploration in the islands, botanically of considerable importance. He follows with vivid ecological descriptions of the islands examined, enumerates and discusses the plant formations and communities, with the influence of factors introduced by man. Finally, he appends a systematic list of the plants, which includes several types dating back to 1792, and not a few records now made new for Western Australia. With thoroughness Mr. Willis compiles this impressive list referentially and emendately, and summarizes by statistical analysis and comparisons with the mainland flora.

Thus the botanical mind obtains a clear general phyto-graphical picture of the Archipelago. Some fascinating facets of Mr. Willis's observations are presented. For example, no two islands visited "were identical floristically, each having an individuality attributable to the composition of the plant communities present, and most islands yielding some species not shared by others." Again, the widespread occurrence, on granite, of *Lobelia anceps*, was of a form hardly recognizable to the less robust plant, of marshy places, in the Eastern States. Incidentally, on one island *L. anceps* was closely cropped by rock wallabies.

Many problems of plant distribution are posed by the dearth of certain common species. Among these Mr. Willis refers to the minimum of *Proteaceae* (only three species—one a Robert Brown type, and one an undetermined isolated *Dryandra*), and *Pteridophyta* (limited to two species). *Amaranthaceae* is conspicuously absent. On the other hand, the Archipelago is rich in *Stylidiaceae* (8 species). The delightful *Stylidium adnatum*, another Robert Brown type (in part) is depicted *in situ*, among the few well-chosen illustrations to the text.

In Part 4 the comparatively attenuated field of Mammals is dealt with by Mr. V. N. Serventy. Pride of place is given to a full-page picture of the Recherche Rock Wallaby. Mr. Serventy treats this as a sub-species, *Petrogale lateralis hacketti*, yet questions the separation specifically of *P. lateralis* from that of *P. penicillata* of Eastern Australia. The author comments freely on introduced factors, such as grazing, human interference, and fire; the last accounting for the virtual disappearance of wooded vegetation on some islands, with resultant depreciation of the native fauna. He considers, however, the rock-haunts of the Recherche Wallaby offers a protection from fire, as the animal was found flourishing. Another wallaby, the Tammar, maintains survival, according to Mr. Serventy, by reason of separation from the mainland, where it has almost vanished. Curiously, Mr. Serventy noted the Tammar and the Rock Wallaby as inhabiting adjacent islands, but not together on the one island. Despite the depredations of sealers in the past, two species of Seals still occur in the Archipelago. One, the Fur Seal, remains at a low population strength.

H. C. E. STEWART.

AMENDMENTS TO THE NOMENCLATURE OF SOME VICTORIAN POLYPORACEÆ

By J. H. WELLS, National Herbarium of Victoria

In recent years it has become apparent that the old morphological criteria for separating genera of polyporoid fungi are quite unsatisfactory, and attention has been focussed upon the microscopic hyphal structure which affords a more reliable and natural basis of division: whether the fruiting body is resupinate or pileate, woody, corky or leathery, smooth or hairy or zoned, whether there are "gills" or pores on the hymenium, it matters little: but whether there are generative hyphae alone, skeletal and generative hyphae together, or generative skeletal and binding hyphae all present, is of vital significance. The primary groups into which many modern systematists now arrange polypores are thus: *Monomitie*, *Dimitie* and *Trimitie*, according to increasing complexity of hyphal structure. This has meant an abandonment of several Friesian groupings of long standing (e.g. *Polystictus* which was a very artificial assemblage) and the establishment of a number of unfamiliar genera—*Anauroderma*, *Piomitopus*, *Coriolus*, *Coltricia*, *Isoneotus* and *Fuscoporia*. Irrisome as are these bewildering changes and the inevitable new combination of names which accompany them, it will be necessary in the future for all Australian mycologists to familiarize themselves with the new nomenclature—this has come to stay.

Dr. G. H. Cunningham, who has adopted the hyphal system in his recent works on New Zealand polyporoids (*Bulletin* Nos. 72-83 of the Plant Diseases Division, N.Z. Dept. Scient. Indust. Research, 1947-1950), is now engaged upon a major revision of all Australasian *Polyporaceæ*. How arbitrary and artificial has been the concept of genera is exemplified by Dr. Cunningham with reference to *Trametes cinnabarina* (the very common, widespread "Scarlet-shelf"): when coriaceous and thin, with a single pore layer more or less embedded in the context, one would refer it to *Polystictus*; when possessing a thick and floccose hymenophore, it could be *Polyporus*; when resupinate, a *Poria*; when having pores inserted at varying depths, a *Trametes*, and when stratified, a *Hanesia*!

During 1948 Dr. Cunningham studied the considerable Australasian *Polyporaceæ* represented in the herbaria at the British Museum and Royal Botanic Gardens, Kew, amending the nomenclature when necessary and embodying the results of his research in a paper to the Linnean Society of New South Wales (*Proc. Linn. Soc. N.S.W.* 75: 214-249, Sept. 1950).

In the light of Dr. Cunningham's published work and the many determinations he has kindly made of Victorian polypores for the writer, it is obvious that corrections must be made in several of my contributions to the *Victorian Naturalist*. The most disconcerting list of alterations concerns the genus *Poria*. In May 1939 [*Vict. Nat.* 56: 7-8], I drew up a key based on gross morphology to 13 of the commoner *Poria* species in Victoria; but no more than five of the names then published remain unchanged! Here follow the amendments which are necessary:

- For *Poria macrospora* Rodw. & Clel., read *P. leucoplaca* (Berk.) Cke.—prior name.
- " *P. vaillantii* (DC. ex Fr.) Cke., read *P. alutacea* Lowe—former misdetermination.
- " *P. minutipora* Rodw. & Clel., read *P. lenis* (Karst.) Sacc.—former misdetermination.
- " *P. uncta* (Berk.) Cke., read *P. radula* (Pers. ex Fr.) Cke.—prior name.
- " *P. subaurantiaca* Rodw. & Clel., read *P. medulla-panis* (Pers. ex Fr.) Cke.—former misdetermination.

For *P. ortheri* (Berk.) Cke., read *P. spissa* (Schw.) Cke.—former misdetermination.

" *P. friessiana* Bres., read *Fuscoporia contigua* (Pers. ex Fr.) G. H. Cunn.—former misdetermination.

" *P. brunneo-adherens*, read *Fuscoporia brunneo-adhaerens* (Ciel. & Rodw.) G. H. Cunn.—generic change.

Common species which might be added to the Victorian list are *Poria eupora* (Karst.) Cke., *P. subcrassa* Rodw. & Ciel. and *Fuscoporia ferrug* (Pers. ex Fr.) G. H. Cunn.; while uncommon species (which are represented at Kew by Victorian material) are *Poria atro-rosea* Cke., *P. vaporaria* (Fr.) Cke., *P. versipora* (Pers.) Rom. and *P. victoriae* (Berk.) Cke.

Corrections to the Club's fungus handbook of 1950 are (under "Polyporoid fungi"):

Page 62 *Fomes robustus* Karst. should read *F. setulosus* Lloyd—a different species.

" *Polyporus eucalyptorum* Fr. should read *P. portentosus* Berk.—prior name.

64 *Poria macrospora* Rodw. & Ciel. should read *P. leucoplaca* (Berk.) Cke.—prior name.

" *Polystictus versicolor* and *Trametes zinnabarii* (but not *T. lilacino-gilva*) are now referable to the genus *Coriolus*, which embraces most of the species previously referred to *Polystictus*.

It is hoped before long to publish (perhaps in the *Naturalist*) a list, as complete as possible, of all Victorian *Polyporaceae* under their generic categories, as now accepted, with familiar synonyms and locality data (where the species have restricted range).

NATURALISTS' NOTE BOOK

[Reserved for your notes, observations and queries]

A LESSON IN FISHING

"I go to Bell Weir above Staines two or three times a year, and have had about three trout there in forty years. These last five years I have noticed a solitary heron which fishes the weir better than I do. He flies down to a little ledge level with the white rushing water, and there stands stiff and still. Suddenly he tightens up his legs, and his neck, instead of being straight, has a slight crook in it. Bang goes his head, and a fish comes up crosswise in his beak. He then raises his head, and you can see his throat undulating as the fish passes down it alive. Finally he gives himself a little shake and resumes his old position."—G. H. SAUNDERS, in *The Countryman*, Autumn 1950.

—Submitted by J. W. RAFF.

MANNA GUMS

Many people have marvelled at the difference between the majestic white-boled manna gums (*Eucalyptus viminalis*) which grow in the hilly country and the rough-barked spreading one which grow on the flatter sandy country. Although those who should know seem to agree that they are two different forms of the one species, I have often thought that I would like to verify this by transplanting a young manna gum from a place like Healesville to Sandringham and to repeat the process in reverse.

As I do not seem to get any nearer to carrying out this interesting project, and as it would take several years in any case to study results, could anyone tell me if such an experiment has ever been undertaken?

—A.E.R.

THE GROWTH OF GREEN PEAS

In the *Vic. Nat.* of June 1953 (70: 26), Mr. Tarlton Rayment remarks that if green table peas were to be planted, the percentage of germination would be very low indeed. Mr. J. R. Garnet thought likewise when, in April 1947, he published his notes on the germination of green peas under refrigeration (see *Vic. Nat.*, 63: 263). But Miss Jean Galbraith gave evidence in July 1947, of two instances when the contrary was the case, and green peas, when planted, germinated as well or even better than dried ones do. (*Vic. Nat.* 64: 59). Has any other Field Naturalist tried it out?

N. A. WAKEFIELD

MOSQUITOES AND YOU

(From *The Countryman*, Vol. 43, No. 2, 1951)

When a Canadian entomologist wanted to discover what attracted mosquitoes to settle on people, he used dummies instead of men. White clothing attracted them much less than black, and green then red and blue, the paler shades of which brought fewer than half as many mosquitoes as the darker ones. When the temperature of the air was above 60° F. a dummy with moistened clothes attracted from two to four times as many of the insects as one with dry clothing, but at cooler temperatures they preferred the dry ones. When a dummy was dressed in a jerkin that had been used to dry the sweat from two men, it attracted twice as many as a clean jerkin moistened to the same extent. Satins were found to be less attractive than broadcloths or crêpes, and woven nylon attracted far fewer insects than cotton shirts and drill trousers.

SUBMITTED BY J. W. RAFF.

WHAT, WHERE AND WHEN

Excursions:

Saturday, October 24—Planting day at Wattle Park. Take Wattle Park tram in Batman Avenue, alight at Main Gates. Meet at Chalet, 2.45 p.m. (Journey takes 40 minutes).

Saturday, October 31—Tuesday, November 3. (Cup Day)—Four day private car excursion to Bairnsdale district. Leader, Mr. H. Stewart. 14 Bayview Terrace, Ascot Vale, W.2. (FU 1096). Full details in August issue.

Tuesday, November 3 (Cup Day)—President's Picnic, 200 mile parlour coach trip to Cape Paterson and Inverloch. Coach leaves Batman Avenue 8.15 a.m., returns 8.30 p.m. Fares 22/-, bookings with K. Atkins, Botanic Gardens, South Yarra, S.E.1.

Saturday, November 7—Keilor. Subject: Keilor Skull Site. Leader: Mr. E. D. Gill. Take 1.40 p.m. train to and alight at Essendon, then bus to Keilor.

Group Fixtures:

Monday, November 2—Geology Group Meeting. Meet at Russell Street entrance National Museum at 7.30 p.m.

Preliminary Notice:

Saturday, December 15—Parlour coach excursion to Mount Franklin, Daylesford, inspecting en route Trentham Falls. Leader: Mr. A. Cubbett. Coach leaves Batman Avenue 8.15 a.m., returns 8 p.m. Fares £1, bookings with K. Atkins Botanic Gardens, South Yarra, S.E.1.

KENNETH W. ATKINS, Excursion Secretary.

The Victorian Naturalist

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No. 839

PROCEEDINGS

The President, Mr. A. A. Baker, was in the Chair and about 120 members and friends were present, at the National Herbarium on October 12, 1953.

The President first opened an Extraordinary General Meeting the purpose of which was to deal with a request by the Native Plant Preservation Society for affiliation with the Field Naturalists Club of Victoria. He quoted the relevant by-law which enabled the Club to accept the request for affiliation.

The President then opened the General Meeting and extended a welcome to some visitors who were present from the Burnley School of Horticulture.

The nomination of Mrs. N. K. Miller for joint membership and as Hon. Assistant Secretary was approved.

The Chairman then introduced the speaker for the evening, Mr. W. L. Williams who gave an exceedingly interesting talk on Victorian Orchids and showed some very beautiful slides of various specimens. Mr. Lewis expressed thanks to Mr. Williams for his interesting address.

The President notified the resignation of Mrs. Lewis as Exhibit Steward and asked for someone to take this position. Mrs. Jenkinson offered to take Mrs. Lewis's place.

Mr. Baker informed the Club of the success of the first Nature Show at Tye's Gallery and Mr. Wakefield discussed the Show to be opened on Tuesday, October 20, in Prahran City Hall, by Major-General Ramsay, the Director General of Education, with the support of Mr. Crosbie Morrison. He asked for assistance from members and gave a list of the exhibits—26 in all.

Mr. Atkins stated that the Leader of the Bairnsdale excursion has been compelled to defer it to a later date owing to insufficient members and the necessity of securing accommodation.

The Meeting was closed at 9.45 p.m. for the usual conversazione.

GEOLOGY DISCUSSION GROUP

The October meeting, held at the National Museum, was attended by 17 members and visitors. Mr. Baker reported on the result of the Darebin Creek survey; the section traversed on September 5, was between Dundas and Wood Streets, Preston. A zone of weathered rock between layers of dense basalt was exposed on a cliff in the area, while further upstream the creek valley widened and the muddy banks contained no rocks of importance. Mr. A. Frostick conducted the subject for discussion, Meteorites and Associated Phenomena; dealing fully with the flight of meteors through the atmosphere and the form, mineral composition and occurrence of meteorites.

KALORAMA EXCURSION

Rain the night before was probably the reason for so few members turning up for the Kalorama General Excursion on October 4. However, except for two brief showers, the weather was particularly pleasant for the occasion. Beautiful views and lovely cloud effects added to the pleasure of the day. It was a little early for quite a number of the plants, but nevertheless there was plenty to be seen—perhaps too much to remember. The acacias (*A. leprosa*, *A. verticillata*, *A. myrtifolia*, *A. stricta* and *A. melanoxylon*) formed the largest flowering group, which, along with *Pultanea gunnii*, formed a pleasant splash of colour over the mountain side. *Pultanea scabra* was still in bud showing colour. *Indigofera australis* was particularly beautiful and colourful. There were a number of patches of Greenhood Orchids (*Pterostylis alpina*), and also a few specimens of *Pterostylis longifolia*. The Bird Orchid (*Chiloglottis gunnii*) was in bud and one specimen was in flower. *Pinus aristata* was at its best and much in evidence, as was *Sporobolus foliolatus* too.

The Grey Thrush, Golden Whistler, Yellow-Robin, Tree Creeper and many other birds were busy among the trees, but, unlike the flowers, they did not stay to be observed.

—A.J.

THE CLUB EXCURSION TO MT. ROYAL ON AUGUST 22, 1953

Despite the earlier showers the afternoon was cool and sunny for the occasion of the visit of the eleven club members who explored the grounds of the Old Folk's Home at Parkville. The Home celebrates its centenary this year and it seemed appropriate that the Club should commemorate the visit by planting a number of Australian native shrubs and trees to add to the existing good collection. With the approval of the superintendent of the Institution (Mr. R. Elliott) and with the co-operation of several of our members and the Melbourne Botanic Gardens, ten young plants were provided and, as the party moved from place to place in the park-like grounds, these were planted, each in what was considered to be the most suitable available position. The plants included *Allocasuarina luekeoides*, *A. rubida*, *A. dealbata*, *Callistemon brachyandrus*, *Callitris drummondii*, *Eugenia smithii*, *Grevillea oleoides* var. *dimorpha*, *Hymenospermum laevis*, *Kunzea baxteri*, and *Leptospermum myrsinifolium*.

Mount Royal is the name bestowed on what was formerly called the Old Colonists' Home. The institution occupies several acres of flower gardens, spacious and well-kept lawns, vegetable plots and pleasant nooks and shaded pathways, beside the creek which runs through the grounds near the eastern boundary. A plantation of eucalypts and other native trees, established about 1945 are now adding to the charm of the grounds. Mahogany Gums, Blue Gums, Bloodwoods and Silky Oaks of an earlier planting are nearing maturity while many of the acacias along the creek bank—in full vigour of growth in 1946—are now declining through old age and attack by borer. The two uncommon species, *A. doratxylon* and *A. dallachyana* are, however, still growing healthily. One specimen of *Wurmba* (*A. rhynchodes*) near the Park Street corner is now quite dead and it seems that it will not be long before specimens such as *A. vestita*, *A. praecissima* and *A. acuminata* will be finished.

The excursion although of no small interest to botanists was not without its interest to the geologists and students of the early history of Melbourne. Where underground drains open into the original creek bed, just inside the north-east corner of the Mount Royal grounds, considerable scouring has taken place to expose the silurian bedrock which at this spot has been apparently folded and pushed to within about fifteen feet of the level of the adjacent street. Other exposures occur along its course through the grounds of the nearby Mental Patients' Receiving Home.

During the excursion it was mentioned that a so-called "donga" which cuts through the slope to Mount Royal from the direction of the Royal Park railway station is not a natural water channel but the result of excavations for sand or gravel some eighty or ninety years ago. It is not known whether the cluster of twenty-nine eucalypts and the solitary *Acaria armata* growing beside the donga are a natural growth or the consequence of a deliberate planting. They seem little different in appearance from what they were twenty-five years ago—perhaps a little more ragged although during that time a mistletoe has established itself on one of the eucalypts. Possibly it is the only example of *Phrygilanthus eucalyptifolius* in the district. It is improbable that a mistletoe bird introduced the parasite in the first instance and one suspects that the seed may have arrived at Royal Park with a possum brought from a distant place by one of the greyhound trainers who infest the park at times. There are plenty of Silver-greys in the trees around about and one is inclined to believe that some of them are survivors from such exercises.

That part of the park nearest to Mount Royal Home exhibits the usual collection of introduced weeds that one finds in suburban open spaces but near the clump of eucalypts a few herbaceous native perennials still manage to survive—a couple of grasses, the Saloop Saltbush and the Blushing Bindweed. However further up the hill, near the tram line, several natives unexpectedly persist. They include the New Holland Daisy, Saloop Saltbush and Blushing Bindweed—a trio which, elsewhere, resist annihilation equally successfully—and Creeping Wood Sorrel, a Scirpus, a Juncus, the Flat Spurge, a Cudweed and, oddly, an orchid. Needless to say the orchid—*Microtis unifolia*—is rarely recognized as such. There are some hundreds of plants there at present. The soil at the spot where they grow is so inhospitable that even the ubiquitous plantains eschew it. —J. ROS GARNER.

DECEASE OF HENRIETTE SINCLAIR

Another link with Baron von Mueller was severed on August 17, by the death at Rockhampton in Queensland of his niece, Mrs. Henriette Sinclair. A very gracious lady, who met her illustrious uncle only once (in 1876), the late Mrs. Sinclair always took a keen interest in affairs of the F.N.C.V., recalling proudly her uncle's close identification with the Club. She distributed copies of the last fungus handbook, in the hope of encouraging several young Queensland friends to take up nature study, and her charming letters were full of enthusiasm for the wonder and beauty of the natural world around her. While on a brief visit to Melbourne, she was able to attend our meeting of April 11, 1949, and was delighted to receive then a flowering sprig of Australia's only *Rhododendron* species (*R. lochae*) which the Baron had made known to science in the *Victorian Naturalist* for March, 1887.

Mrs. Sinclair supplied practically all the material—old family letters, photographs and books—for the first two chapters of the Mueller biography ("By Their Fruits"), and this early period of the botanist's life would have remained almost blank without such important information. She has also donated many valuable relics of the Baron to the Melbourne National Herbarium. Among her accomplishments were home-nursing, a little painting and exquisitely moulded pottery-work. Her father, Dr. Edward Wehl (who married the Baron's youngest sister Clara), was the first medical man in the far south-east of South Australia, and it used to be thrilling to hear Mrs. Sinclair tell of his pioneering exploits in the Mt. Gambier district where she was born.

All who were privileged to be friends mourn her passing and offer real sympathy to her surviving family and descendants. —J.H.W.

A NEW SCIENTIFIC SOCIETY

A newcomer to the ranks of Australian scientific societies is The Society of Entomologists, Sydney. The first official move to form this organization occurred at a meeting held on December 9, 1952 when eight people gathered together and resolved to form a society to promote an interest in entomology by means of lectures, publications, etc. Temporary officers were appointed to act as chairman, honorary secretary and honorary treasurer, and the chairman was empowered to circularize people likely to be interested and to convene an inaugural meeting at a suitable time and place.

The response of interested people was beyond expectations, thus demonstrating the need for such a society. The inaugural meeting was held at Science House, 157 Gloucester Street, Sydney on February 20, this year. Fifty-two people were present, and at the conclusion of business for the night the society had 95 financial members. Since that date the membership has grown to a total of 125 at the end of August, six months after the inauguration.

Membership is derived from people in many walks of life—professional entomologists, medical men, foresters, pest control operators, chemists, teachers, etc., as well as many others who are interested in entomology purely as amateurs. Naturally most of the members live in New South Wales, but all mainland states are represented as well as New Guinea, British Guiana and Argentina. Besides ordinary membership (for those living within the County of Cumberland, which embraces the Sydney metropolitan area), provision is made, at a lower fee, for associate members (people living outside the County of Cumberland), and for student (or junior) members.

Up to the present the main activity of the society has been to arrange lectures, a summary of each of which is sent to all members. Speakers have included the following: Mr. E. Fogl, "The Sterilization of Timber by Fumigation"; Mr. J. H. Burden, "Entomology in Relation to Medicine"; Mr. T. Greaves, "The Argentine Ant as an Australian Problem"; Mr. A. N. Johnston, "Insect Toxicology with Special Reference to Systemic Insecticides"; Mr. T. G. Campbell, "An Entomological Survey of the Cocos-Keeling Islands"; and Dr. A. R. Woodhill, "Some Aspects of Mosquito Ecology." A screening of entomological films was also held at one meeting. The society aims at providing lectures on all aspects of entomology by people who are recognized as authorities in their own special fields.

One gratifying feature has been the friendly approaches made by the older Entomological Society of Queensland and the Entomological Society of New Zealand and the subsequent exchange of publications and circulars with these two organizations.

The officers of the society are as follows: President, Mr. C. E. Chadwick; Vice-President, Mr. E. A. Atkinson; Hon. Secretary, Mr. E. L. Jones; Assistant Hon. Secretary, Mr. M. Casimir; Hon. Treasurer, Mr. P. Hadlington; and Council Members—Miss K. English, Mrs. M. Casimir, Mr. G. J. Shanahan, Mrs. N. Turner. The address of the Hon. Secretary, Mr. E. L. Jones, is 17 Chisholm Street, Greenwich, Sydney.

—C. E. CHADWICK.

OBITUARY

Miss Margaret Lillian Flockton, botanical artist, died at the age of 91, on August 12, 1953, at Tennyson, N.S.W. She came to Australia from England at the age of nineteen and for over forty years she was the artist at the Sydney Botanic Gardens where she prepared most of the illustrations for the late J. H. Maiden's botanical books. She also prepared for publication a booklet of coloured plates of Australian wild flowers.

—D. J. DICKSON.

MOSQUITO SURVEY IN THE MELBOURNE AREA

By NANCY E. KENT, B.Sc.

SUMMARY

During the period from late February, 1952 to the end of April, 1952 a survey was undertaken of mosquitoes breeding in the Melbourne area. In all, the larvae of 11 species belonging to 4 genera, namely *Anopheles*, *Culex*, *Aedes* and *Theobaldia*, were collected. The majority of these larvae were bred through in the laboratory and the resulting adult insects retained for positive determination. A number of different types of larval habitats were sampled and a note made of the species breeding in each.

INTRODUCTION

The survey was carried out from the Walter and Eliza Hall Institute of Medical Research, its purpose being to provide a guide to collecting places for mosquito larvae which may be required by the Institute for future laboratory experimental work on Murray Valley Encephalitis. The area covered during the survey comprised the main Melbourne suburban portion and, in addition, included a few of the more outlying districts as far afield as Broadmeadows to the north-west, Upper Ferntree Gully to the east, and Dandenong to the south-east. The north-eastern suburban districts were not, however, covered during the course of this particular survey.

LARVAL HABITATS

During the survey a number of different types of breeding places were sampled, but it is not intended that the work done should be regarded as entirely comprehensive.* Tree-holes, for example, the natural habitat of many species, were not examined. However, breeding places yielding good catches of larvae included wide sluggish creeks, semi-permanent water-holes in creek beds, large grassy swamps, salt-marshes, brackish pools, and concrete wells and drainage pits. No larvae were found in the salt water of coastal rock pools above high tide level, although at least one species, *Aedes* (*Pseudoskusea*) *concolor* Tayl., is known to breed in such situations in other parts of Victoria.

The most common mosquito at the time of this survey and in the breeding places examined was *Culex pipiens australis* Dobrotworsky & Drummond with *Aedes albopictus* Macquart., *Culex pipiens molestus* Forskal., *Anopheles annulipes* Walk. and *Culex globocoxitus* Dobrotworsky following in that order. Larvae of *Culex fatigans* Wied., *C. fergusoni* Tayl., *Aedes camptorhynchus* Tomson, *Ae. occidentalis* Skuse, *Ae. notasciurus* Skuse and *Theobaldia inconspicua* Lee were also collected. Adults of *Ae. camptorhynchus* were extremely numerous and would appear to be the chief day-time biters at this time of year, but few of their favoured larval habitats, i.e., brackish marshes, were examined. Larvae of the genus *Theobaldia* were found breeding in the Melbourne area for the first time—in a concrete drainage pit in the Botanical Gardens. *T. inconspicua* is also known to breed in fresh water rock and ground pools (Lee, 1944), and is common in the Dandenong Ranges.

SPECIES COLLECTED AS LARVAE

Twenty-nine larval collections from 28 sites were made during the period under discussion. These sites comprised 13 varieties of breeding places. The larvae collected were bred through in the laboratory and the resultant adults used for positive identification. In all, 11 species of mosquitoes were

*A list giving the exact location of breeding sites, together with the species collected from these sites, has been lodged with the Editor.

collected as larvae in the Melbourne area during the survey. The observations are summarized in the table on page 120.

Anopheles (Myzomyia) annulipes Walk.

This species was found breeding in 11 of the 28 sites inspected, but was not particularly abundant in any of these places. Larvae were collected from semi-permanent waterholes in creek beds (from 5 of the 3 sites examined); from wide sluggish creeks with grassy edges; from semi-permanent swampy areas; from an earthen roadside ditch and from a slightly brackish pool. According to Lee and Woodhill (1944), *A. annulipes* is "most catholic in its breeding habits and has been recorded from sunlit, shaded, clear and muddy water, from weedy rock pools, running water alongside stones, gravel beds on creek banks, open sandy pools, swamp margins, hoof marks, wheel tracks, slit trenches, water-holding rubbish, and from brackish water up to 1.6‰ salinity. It has also been recorded in tubs and fish ponds adjacent to houses."

Culex (Culex) fatigans Wied.

Larvae of this species, usually a domestic mosquito, were collected from concrete drainage pits (Fawkner Park housing settlement and Botanical Gardens); from an earthen roadside ditch containing polluted water (Upper Ferntree Gully); and from a semi-permanent waterhole in a creek bed off the Dandenong Road. In none of these places were *C. fatigans* larvae found in any considerable numbers. Artificial containers in domestic situations are the normal habitat of this species (Lee 1944), but few were examined during the course of this survey. However, Mr. N. V. Dobrotworsky has informed me that his observations over the last two years have shown that *C. fatigans* is not an abundant mosquito in the vicinity of Melbourne.

Culex (Culex) pipiens australicus Dobrotworsky & Drummond

This species was found breeding in 21 of the 28 sites examined, its habitat covering a wide range of situations and including broad sluggish creeks with grassy edges; semi-permanent waterholes in creek beds, often, but not always, with grassy edges; grassy seepage pools beside a creek; an earthen roadside ditch; concrete drainage pits; grassy depressions beside a stormwater channel; semi-permanent swampy areas; earthen dams with hoof-prints and slightly brackish pools. It did not, however, appear to be present in salt-marsh areas; neither was it found in the only large grassy swamp examined during the survey. In the Mildura area, during the work carried out in the summer 1951-52, this species was not found to be breeding in permanent waterholes, but was present in all other types of ground water.

Culex (Culex) globocoxitus Dobrotworsky

Larvae of this species were collected from 10 of the 28 sites inspected, but were not usually very numerous. Breeding places were semi-permanent waterholes in creek beds; a wide sluggish creek with grassy edges; a large grassy swamp; an earthen dam with hoof-prints; brackish pools; a concrete well and a drainage pit. This species was often found in association with *C. pipiens australicus* and *C. pipiens molestus*.

Culex (Culex) pipiens molestus Forskal.

C. pipiens molestus was found breeding, often in very considerable numbers, in 11 of the 28 sites examined during the survey. Breeding places were as follows: semi-permanent waterholes in creek beds (collections from two of the eight sites); grassy depressions beside a stormwater channel; a semi-permanent swampy area; an earthen dam with hoof-prints; an earthen roadside ditch; drainage pits and a concrete well,

Culex (Neoculex) fergusonii Tayl.

C. fergusonii typically is a rural mosquito and is probably not very abundant in the Melbourne suburban area. It was found breeding in small numbers in two sites only, both semi-permanent waterholes in creek beds, one at Wattle Park and the other near Springvale. Lee (1944) states that it normally breeds in fresh water ground and rock pools, often in association with *Spirogyra*.

Aedes (Ochlerotatus) camptorhynchus Tomson

As stated earlier, adults of *Ae. camptorhynchus* were numerous and widespread; these mosquitoes are vicious daytime and early evening biters, especially under trees. The larvae were found breeding in brackish pools and, particularly, in salt-marshes (Fisherman's Bend); isolated specimens were also collected in the wide sluggish creek with grassy edges at Broadmeadows. Although the larval habitat is usually given as brackish water (Lee 1944), this species will, in fact, tolerate a wide salinity range and breeds freely in fresh water.

Aedes (Finlaya) alboannulatus Macquart.

Ae. alboannulatus was found breeding in 12 of the 28 sites examined, but in most cases not as prolifically as was *Culex pipiens australiensis*. Larvae were collected from semi-permanent water-holes in creek beds (from seven of the eight sites inspected, and including one fresh water rock pool), from a wide sluggish creek with grassy edges (at Broadmeadows); from grassy depressions beside a stormwater channel; a semi-permanent swampy area; a grassy seepage pool from hillside drainage (at Upper Ferntree Gully) and from a brackish pool. This species was not actually found breeding in concrete wells or drainage pits although adults were taken biting in the vicinity of these sites and resting on the walls thereof (Fawkner Park drainage pit, Botanical Gardens footpath grids, and the well of a private residence near Dandenong).

Aedes (Finlaya) occidentalis Skuse

Ae. occidentalis was found breeding in two sites only—in a concrete well near Dandenong and in a grassy seepage pool from hillside drainage at Upper Ferntree Gully. Lee (1944) has recorded this species, indistinguishable in the larval stage from *Ae. alboannulatus*, in fresh water ground and rock pools and occasionally in brackish marshes.

Aedes (Finlaya) notoscriptus Skuse

This species breeds commonly in tree-holes. Such sites were not examined during this survey, but the larvae were found in considerable numbers in a drainage pit in the Melbourne Botanical Gardens. Larvae were also collected from a concrete well near Dandenong and from a grassy seepage pool from hillside drainage at Upper Ferntree Gully. Lee (1944) states that *Ae. notoscriptus* breeds in rock pools, tree-holes, tanks, tins and similar containers. Adults of this species taken in the Melbourne area were generally larger insects than those collected in the vicinity of Mildura during the period December, 1951-February, 1952.

Theobaldia (Culicella) inconspicua Lee

Although this species is known to be common in the Dandenongs, it has not been recorded previously as breeding in Melbourne itself. However, during this survey, larvae of *T. inconspicua* were found in fairly large numbers in a covered concrete drainage pit in the Botanical Gardens, and numerous adults were taken resting on the walls of the pit. Lee (1944) states that its habitat is fresh water rock and ground pools.

Mosquito Breeding Sites Examined in the Melbourne Area

February-April, 1952

LARVAL HABITAT	Number of Sites Examined	SPECIES COLLECTED									
		<i>Anopheles annulipes</i>	<i>Culex fatigans</i>	<i>Culex pipiens australis</i>	<i>Culex globocoxitus</i>	<i>Culex pipiens molestus</i>	<i>Culex fergusoni</i>	<i>Aedes camptorhynchus</i>	<i>Aedes albopictus</i>	<i>Aedes occidentalis</i>	<i>Aedes notoscriptus</i> <i>Theobaldia inconspicua</i>
Creeks, wide, sluggish, grassy edges	3	2		2	1			1	1		
Semi-permanent water-holes in creek beds (i.e. ground and rock pools)	8	5	1	8	4	2	2		7		
Seepage pools from creeks	1			1							
Grassy depressions beside stormwater channel	1			1		1			1		
Semi-permanent swampy areas	2	2		1		1			1		
Large grassy swamps	1				1						
Earthen dams with hoof-prints	2			2	1	1					
Earthen roadside ditches	1	1	1	1		1					
Grassy seepage pools from hillside drainage	1								1	1	1
Brackish pools	2	1		1	1			2	1		
Salt-marshes	1							1			
Concrete drainage pits	4		2	3	1	4					2
Concrete wells	1			1	1	1				1	1
TOTALS	28	11	4	21	10	11	2	4	12	2	4

ACKNOWLEDGMENTS

The opportunity is taken of thanking those friends and colleagues who helped in the preparation of this paper. In particular, I am grateful to Dr. F. H. Drummond of the Zoology Department of the University of Melbourne for his advice and for the trouble he took in checking my identifications, and to Mr. N. V. Dobrotvorsky of the same Department for his able assistance and co-operation. The interest taken by Dr. Gray Anderson of the Walter and Eliza Hall Institute of Medical Research during the compilation of the paper was very much appreciated, as was the help and advice given me by Mr. Warren Perry who read the early drafts.

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A SNAKE AND A DRAKE

The article "Do Snakes Fascinate Birds?" by Tarlton Rayment in the *Victorian Naturalist* of March, 1953 (69: 11) brings to mind an incident I once witnessed involving a snake and a drake.

It was in the days when the University was able to boast of a lake. The snake, by that time dead, had been found in Queen Street and brought to the University in a sugar bag to be offered for scientific purposes. The owner of the bag took out the dead snake and laid it straight and facing away from the Lake but towards a Muscovy Drake which up to this stage had been taking very little interest in the proceedings.

The drake took one look at the dead snake and fled in mortal terror and with great rapidity to the sanctuary of the water. And that is all there is to the story, for how the drake came to recognize the snake as a dangerous enemy, I cannot even conjecture. Can you?—A.E.R.

A BLUE WREN CHANGES HIS COAT

By JEAN GALBRAITH, TYERS

On July 26, this year I noticed a certain dishevelment about the cock Blue Wren that comes to our window-sill for crumbs. Until then his only difference from his mate was the dark blue tail. The change from normal trimness was soon accounted for by the appearance of the tips of several scattered black feathers in his grey breast.

During the next three weeks I kept notes of the development of his full plumage:

July 28, black feathers form a dotted line, like the rim of a bill, from ear to ear.

July 29, black feathers on each shoulder at apex of wing.

July 30, black forms a definite but intermittent semicircle from shoulder to ear, as well as across the breast. General effect patchy. No blue visible in morning, but in the afternoon one could see the beginning of two turquoise ear patches, and by 4.30 p.m. there were many scattered turquoise feathers on head and sides of face.

July 31, blue on forehead and either side of face, as well as black at base of tail. Also some blue feathers on breast (later hidden by black).

August 1, all lines and patches of colour thickening to form a definite pattern.

August 2, patches of blue much wider, but still only broad stripes, a little interrupted. Crown and back still grey.

August 3, black patches on head and shoulders nearly complete, and developing on throat. Blue spreading up toward forehead from the back. Crown and back of neck still grey, and cheek patches still only stripes.

August 4, blue and black more solid and blue patches wider but pattern little changed.

August 5, front view looks like that of a bird in full plumage, but the side view "pattern" is blurred by grey feathers that will later be blue. A faint indigo "wash" on each side below black throat and breast.

August 6, blue cheek patches complete except for apparently one feather.

August 7, plumage complete except for forehead and crown. Blue spreading slowly upward toward top of crown.

August 8, blue almost covering top of head.

August 9, all plumage appears complete except for about one grey feather at the back of the blue cap, and a narrow grey line running backward to a point between the shoulders.

August 10, full plumage. Last grey on head disappeared this afternoon three weeks and a day after the appearance of the first black feathers.

Other observers have noticed a tendency of the male Blue Wren to keep out of sight amongst undergrowth during plumage changes, and I have never seen one at this stage before, but the bird I have described was no more retiring than usual, coming many times every day for crumbs from the window-sill of our living-room, not more than two feet from my writing table.

I did note however that he did not sing at all during this time. All I heard were small twitterings between cock and hen, but during the fine days since August 10, I have heard the familiar song of the two birds singing loudly together.

NEW BEES AND WASPS—Part XXI

By TARTLTON RAYMENT, F.R.Z.S.*

PARASITES ON SERICOPHORINE WASPS

Clifford Beauglehole was fortunate in collecting several multilids which haunted the vicinity of the shafts of *Sericophorus*, and there is little doubt that some of these at least are parasitic on the larvae of the wasps. His most interesting discovery was a wasp of another genus, and which he thought might deposit its egg on the young larva.

This observer posed the following question: "Do you know of any parasitic wasp which lays its eggs in the sericophorine nests? There is one here which appears to be parasitic. I watched its actions for a considerable time, and it immediately followed down a sericophorine that had just descended with her fly. A few minutes later, the parasite (?) emerged from the shaft, and waited at the top, facing the entrance, and every now and then she looked down the shaft, as though expecting something to happen. The sericophorine came up out of the shaft after a few minutes, drawing the front legs over her jaws and face, and while she was engaged in cleaning her eyes, the parasite moved back out of sight behind the mound at the entrance. After the sericophorine wasp had flown away, the parasite went to the entrance again, and was about to descend, when it was disturbed by a passing automobile. However, I was successful in obtaining two specimens for you."

These small wasps, about 7 mms. in length, are black, red and yellow in colour, with a superficial likeness to certain species in the genus *Lavia*, family STILINIDAE, although they lack the hooked antennal segments of that genus. The behaviour pattern is, however, very different, and does not appear to have been studied in Australia. *Lavia*, moreover, has three cubital cells in the anterior wings.

They differ from *Orybelus* (not recorded for Australia) by the neurulation of the wings; *Orybelus* having the cubitus vein obsolescent, so that the cubital and the discoidal cells are confluent. The postscutellum has lamellar expansions on each side, and the epinotum is produced into a spine or micro as in *Nysson*.

The general facies is quite unlike *Paranysson*, which has three distinct cubital cells: the first recurrent entering the long first cubital cell, as in *Sericophorus*; the second recurrent entering the small second cubital.

Several small black wasps, 5.5 mms. in length, were taken at the same time and place. The two sexes of the wasps were taken in copula, so that there is no doubt about the correct association of the sexes. The male closely resembles the female, except for the differences which are no doubt sex characters. The male is very different indeed from the much larger (7 mms.) *Nysson gilberti* Turn., in the collection of the C.S.I.R.O., Entomological Division, Canberra, F.C.T., and which I was able to study by the courtesy of the Director, Dr. J. Nicholson. This new species is however closely related to *N. gilberti* by the lateral spines on the dorsum of the epinotum, but differs by the neurulation of the wings; *N. gilberti* having the first recurrent practically meeting the first intercubitus (morphologically the second intercubitus) and light-brown nervures in the wings.

It will be observed from the illustrations of the new species, that although both recurrent nervures enter the long first cubital cell, the position undoubtedly indicates that one of them would have been received by the (morphological) second cubital cell, had the first intercubitus nervure not been extinguished thus leaving only two cubital cells. I propose two new names, and append the specific descriptions.

*Hon. Associate in Entomology, National Museum, Melbourne.

NYSSON PORTLANDENSIS, sp. nov.

Type, Female—Length 6.5 mm. approx. Black and red, with yellow markings.

Head small, transverse, black, with much lustrous straw-coloured appressed hair over the face; frons closely punctured, with a compressed tubercle; clypeus black; glossa short and broad, six black segments in the maxillary palpus; supraclypeal area ill-defined; vertex closely punctured, with sparse fine hair; a few much larger shallow punctures; compound eyes rather small; genae with lustrous straw-coloured hair; labrum reddish; mandibulae acute, reddish, but black apically; antennae submoniliform, brownish above, scapes and flagellum red beneath.

Prothorax long, dark-red, large punctures, covered with pale-yellow lustrous hair; tubercles dark-red, with pale hair, meeting the prothoracic collar; mesothorax black, dull, large punctures, with many microscopic ones between, lamellar extensions posteriorly red, scattered pale lustrous hair; scutellum with similar sculpture, black; postscutellum black, rougher, with pale hair; metathorax black, with two large lateral spines tipped with red, but having the black bases masked with appressed straw-coloured hair; the dorsum showing a deeply-pitted structure; abdominal dorsal segments black, with many large punctures and microscopic ones between; each segment has a broadly interrupted ivory-yellow band, the margins of which are suffused with reddish; there is some fine pale hair; and a red macula laterally on basal tergum; ventral segments black, with fringes of short pale hair.

Legs slender, red, the coxae, trochanters and femora blackish; each of the tibiae has many fine white spines; tarsi dark-red, anterior with a comb of five slender spines; claws red; pygidial plate blackish-brown, rugosopunctate; hind calcariae simple, black, not long; tegulae dark-reddish, same colour as the legs; wings deeply fuliginous, especially on the radial cell and apically; nervures black, both recurrents entering on the long first cubital; the second cubital cell triangular, stalked; pterostigma inconspicuous; lamuli small, but numerous, about fifteen.

Locality—Cape Nelson-road, Portland, Victoria, Jan. 25, 1953, leg. Clifford Beauglehole.

Type and allotype in the collection of the author.

Allies: *N. gilberti* Tuen., which has an entirely red basal segment on the abdomen, and is more coarsely punctured; amber nervures in clear wings; red legs; second recurrent nervure meeting the first intercubitus; apical segments of abdomen with much hair.

Taken from shafts of *Sericophorus victoriensis* Raym.

NYSSON HENTYI, sp. nov.

Type, Male—Length 5.5 mm. approx. Black, ivory-coloured markings.

Head transverse, black, closely and deeply punctured, with many microscopic punctures on the ridges between; face with much appressed silvery hair; frons narrowest at the insertion of the scapes, where it is greatly contracted; clypeus concave, black, coarsely punctured, with more silvery hair masking the sculpture; supraclypeal area elevated to a short carina; vertex widely rounded, sculpture similar to rest of head; compound eyes large, anterior margins converging strongly at insertion of scapes; genae similar to rest of the head; labrum ferruginous; mandibulae ferruginous, acute, black basally; antennae black above, submoniliform, dull-red beneath, scapes short and thick; two apical segments excavated (see fig. 29).

Prothorax long, sculpture similar to that of the head; tubercles black, adjacent area elevated; mesothorax black, excessively coarsely punctured, the rugae between polished; scutellum and postscutellum similar; metathorax black, short, deeply pitted on dorsum, the posterior, "carrier" of

which is developed to a long curved black tooth, about the base of which is much silvery hair; abdominal dorsal segments black, the coarse punctures well spaced, with numerous microscopic punctures between; a few short white hairs; 1 with a red spot basally, and an ivory stripe laterally; 2 and 3 with a similar ivory stripe; ventral segments of similar sculpture, with some white hair; apical plate bi-lobed in male.

Legs black, slender, a trifle of appressed silvery hair, femora and knees suffused with red; (anterior legs almost entirely red in female); tarsi slender, obscurely brownish; claws simple, brown; hind calcar microscopically serrate, black; tegulae black, shining, smooth; wings subhyaline, somewhat fuliginous apically; nervures brownish-black, both recurrents entering the first cubital; the second recurrent would have entered the second (morphological) had the second intercubitus not been lost; second cubital cell (third morphologically) triangular and stalked; pterostigma brownish-black, very small; hamuli strong, eleven or so.

Locality: Portland, Cape Nelson-road, Jan. 25, March 1; (*in cop.*) 1953, leg. Clifford Beauglehole.

Type and allotype in the collection of the author.

Allies: Too few species are known for comparisons. Anomalously, the males in this species are larger than the females, which are very much smaller than *N. portlandensis*, which has much more red. The female may readily be recognized from the above description, but the following are no doubt sex characters.

The apical segments of the male are excavated in a peculiar manner (see Fig. 29); there are 12 segments in the antenna of the female, and 13 in that of the male; the mandibles of the female are much longer and more acute; the apical tergum of the male is bi-lobed, that of the female bears a naked coarsely-punctured caudal plate; in the three males studied there are no specific characters in the genitalia; the scapes of the male are much thicker than those of the female.

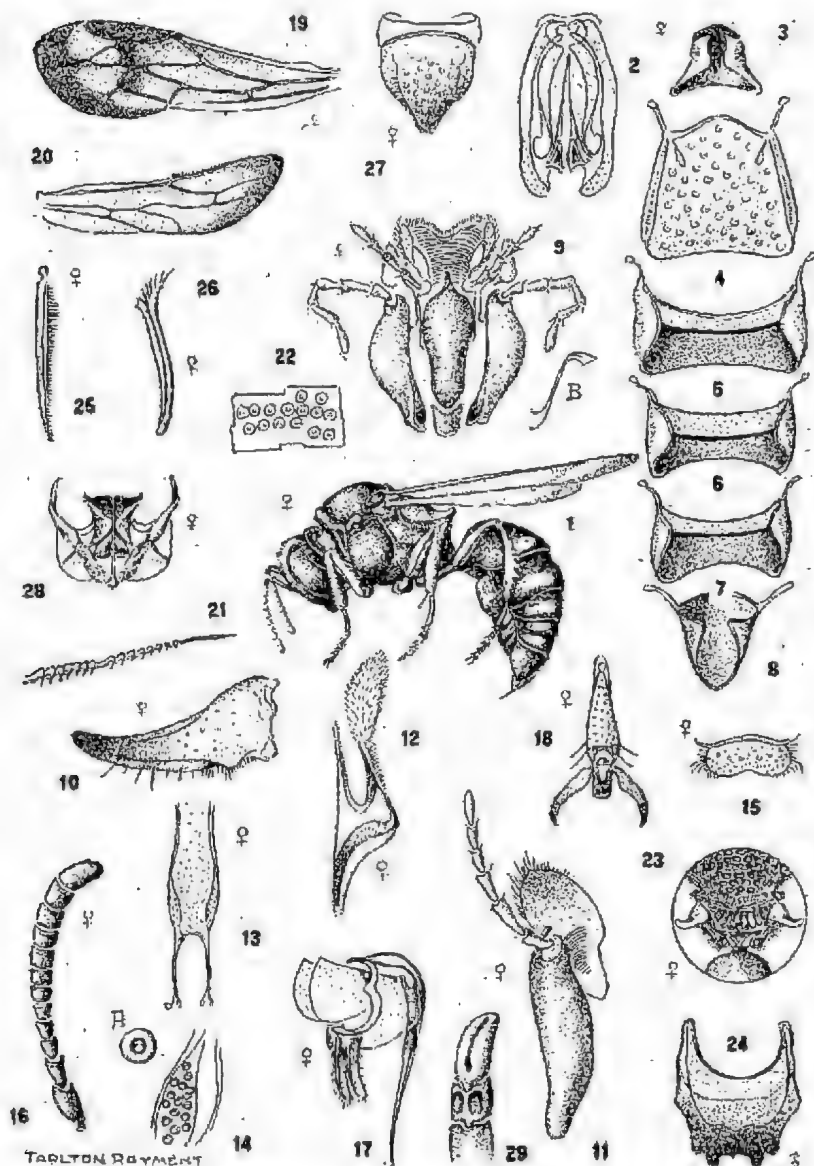
Taken mating over the shafts of *Sericophorus victoriensis* Raym.

Writing of his collection of this species, Clifford Beauglehole states:

"When I visited the site of the nests of *Sericophorus victoriensis*, Raym. along the Cape Nelson-road, on a beautiful morning in March, 1953, I saw the smaller black species flying freely. Three of the wasps were flying in and out among the stems in a cluster of braken ferns and other plants, and were only a few inches above the sandy ground of the road-side. Usually, they flew in single file, and I was hoping that both sexes were present, so I spent considerable time following them with the hope that I should establish the actual coupling. Fortunately the wasps limited their flight to an area a chain or so in length, and which roughly covered the site of the shafts of *Sericophorus*. Suddenly, one of them, the female, 'landed' on a small stick, and was immediately followed by a male, and mating took place while the female was still resting on the stick."

The exact relationship of these nyssonid wasps to the sericophorines is not known, but the behaviour of the first suggests that it may be parasitic. Phil. and Nellie Rauf, in America, observed that *Stisus uncinatus* Say, "loafed" about the shafts of another wasp, *Prionyx thomae* Fabr., until a suitable opportunity arose when it descended the shaft, and ate the egg of the host before depositing its own. The Australian nyssonid may have committed a similar destruction when it emerged "licking its chops." By a curious coincidence, both the American and the Australian observers used that expression; they were, of course quite unknown to each other.

In the Portland species at least there is apparently a very close association, and the life-cycle of the nyssonids appears to be passed in the vicinity of the sericophorine shafts. Clifford Beauglehole has observed both sexes of the



Details of *Nysson portlandensis* and *Nysson hentyi*
(Key on opposite page)

smaller species, *N. hentyi*, sp. nov., flying hither and thither over the shafts of the sericophorines, only a few miles from Portland.

He did not see this smaller black species descend any shafts, but the larger red one certainly does, and on excavating several cells of *Sericophorus victoriensis*, sp. nov. (in the Press), he found a spot of moisture on a fly where the sericophorine egg should have been. Since this was experienced more than once, it would appear that this Australian nyssonid may destroy the egg after the habit of the American *Stenomus*.

Key to Illustrations

Fig. 1, Lateral view of adult female wasp *Nysson portlandensis*, sp. nov., 2, Genitalia of male *N. hentyi*, sp. nov.; 3, 4, 5, 6, 7, 8, Sternal plates of the female *N. portlandensis*; note the excessively large second sternum; 9, Mouth-parts of the female; B; One of the spatulate hairs of the glossa; 10, The mandible is simple and acute—not notched as in *Sericophorus*; 11, Maxilla, with galea and palpus: note the maxillary comb as in *Anthophoro*; 12, Paraglossa detached from the mouth-parts; 13, Pharyngeal rods showing openings of ducts of the pharyngeal glands; 14, Ducts more highly magnified; A: Each duct appears to be encircled by a raised rim; 15, Labrum of the female wasp; 16, Many of the segments of the flagellum are wider than long; 17, The sting of the female is short, and of only medium development; 18, The claws of the female are simple, with pulvillus much reduced; 19, 20, Anterior and posterior wings of the female; 21, The fifteen hamuli joining the two wings are strongly developed; 22, Pore-organs (olfactory?) at the base of the glossa resemble the openings of the pharyngeal ducts (See No. 14); 23, Metathoracic area showing the two dentate processes of the dorsum of the epinotum; 24, Apical tergum of the male *N. hentyi* is bi-lobed; 25, The hind calcar of the female is microscopically serrated; 26, Strigilis of the anterior leg of *N. portlandensis* has a malus but no velum; 27, The caudal plate of the female *N. hentyi* is excessively coarsely punctured; 28, The first (prosterital) furca, or internal skeletal structure, lies immediately over the anterior legs: The second and third furcae (metasternal) are united near the metathorax, but are not included here; 29, The apical segments of the male flagellum are somewhat excavated.

NATURALISTS' NOTE BOOK

[Reserved for your notes, observations and queries]

BUTTERFLIES ON MUD

[From *The Countryman*, Vol. 43, No. 2, 1951]

"Twice in recent years I have seen small groups of green-veined white butterflies clustering on mud or damp moss by the side of small streams. Were they drinking?"—R.E., Oxfordshire

(The late A. D. Tinnis reported that he had seen holly blues suck up moisture from soil after a shower, and was of the opinion that, when they resorted to wet mud, it might be for moisture only. He pointed out, however, that the purple emperor butterfly is well known to feed on carrion, dung and sap exuding from trees, and that in the tropics butterflies often congregate in 'flocks' on wet mud or other places where they can suck up decomposing organic fluids of various sorts. C. L. Collenette writes of gatherings of up to 2,000 butterflies on damp sand by rivers in Mato Grosso, Brazil, where men or animals have trodden, apparently attracted by their perspiration. Sweaty garments hung up in the forest also attracted several species of butterfly. If a handkerchief soaked in sweat was dipped in the river and then wrung out on the sand, this spot became the most popular on the sandbank for butterflies.)

—Submitted by J. W. RAFF

A FREAK SKINK LIZARD

Last summer, at Bidwell, I was shown, soon after its discovery, a skink lizard with two heads, one of them where the tail should have been. I was told that the specimen would be sent to Mr. Crosbie Morrison. It was so phenomenal that I am eager to have expert opinion about it, and probably other members of the Club would be equally interested. Would a specialist member kindly contribute to the journal some comment either on that specimen or on the general subject of freak growth of skink lizards?

W. HUNTER.

GREVILLEA WILSONII

In 1938 I obtained a plant of *Grevillea wilsonii* which grew into an excellent shrub but gave no indication of flowering. However this year it is going to flower for the first time and in view of its healthy condition it seems remarkable to have been without flowers for 15 years. This grevillea which inhabits the gravelly soil of the Darling Range, Western Australia, has deep green divided leaves and intensely scarlet flowers carried in clusters at the extremities of the branches. In cultivation a heavy type of soil would prove beneficial but as with many other Western Australian species the difficulty is to obtain plants.

—J. S. SEATON.

WHITE COCKATOOS

Large flocks of the white or sulphur crested cockatoo (*Kakator galerita*) are often seen feeding in open spaces about the countryside, as they were on our excursion to Mount William earlier last year.

Is it true that these birds send a scout to reconnoitre a likely feeding ground, and then travel to the area themselves if he brings back a favourable report?

I have also been told that an observer is posted to announce to the flock the approach of danger. Is this another popular fallacy, or is it partly or wholly true?

—A.E.B.

[See humorous article "Scratch Cocky" by Dr. F. P. D'Avey in *Vic. Nat.* 62: 51 (July 1946).—Ed.]

WHAT, WHERE AND WHEN**Excursions:**

Sunday, November 15—Three mile walk to Mount Morton. Subject: Botany. Leader: Botany Group. Take 8.45 a.m. Upper Ferntree Gully train, then bus to Belgrave South. Bring one meal.

Sunday, November 29—Seville. Subject: Birds. Leader: Mr. A. E. Hanks. Take 9.10 a.m. Warburton train from Flinders Street, alight at Seville. Arrive back in Melbourne 7.20 p.m. Bring two meals.

Saturday, December 5—Parlor coach excursion to Mount Franklin, Daylesford, inspecting en route Trentham Falls. Leader: Mr. A. Cobbett. Bring two meals. Coach leaves Bateman Avenue 8.15 a.m., returns 8 p.m. Fares £1, bookings with K. Atkins, Botanic Gardens, South Yarra, S.E.1.

Group Fixtures:

Tuesday, December 1—Geology Group Meeting. Meet at Russell Street entrance National Museum at 7.30 p.m.

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PROCEEDINGS

At the General Meeting held at the National Herbarium on November 9, the President, Mr. Baker was in the Chair and about 120 members and friends were present. Mr. Baker informed the Club that Mr. Gabriel had been ill in the Freemasons' Hospital, but would shortly be with us again.

In view of the death of a Club Member, Mrs. L. A. Cochrane, the President asked members to stand for one minute's silence as a mark of respect.

Messrs. P. B. Moore, John W. Moore, Ken Hirst and J. Echberg and Miss Hazel Knott were elected as Ordinary Members, and Miss Helena A. Doyle as a Country Member.

Mr. Baker then introduced the speaker for the evening, Mr. Wakefield, who gave an interesting address regarding the impressions he had gained from the recent Nature Show held at the Prahran City Hall, and some ways by which the Club could further its educational aims. The address is reported elsewhere in this issue.

Mr. Pederick, Chief Inspector of Primary Schools, of the Victorian Education Department, spoke in support of the schemes put forward, suggesting that the Club should prepare a concise proposal to place before the Director of Education. Mr. Pederick said that he would be pleased to accompany a Club deputation for this purpose.

Mr. Alec H. Chisholm, visiting from Sydney, was welcomed to the Meeting, and spoke briefly to the Club, commending it on the high standard of various of its activities.

It was announced that Mr. W. L. Williams had been appointed to the Club Council, to replace Mr. E. E. Lord who had resigned.

Members were told that Club Christmas Cards were available from Mr. Lee, the Assistant Librarian.

Mr. Hanks read a description from an early *Naturalist* of the first Club camp-out, and the finding of the first nests of the Helmeted Honeyeater; and Mr. Lewis read an article from the Times Weekly Review, reporting the appearance in numbers of England's rare Coral-root Orchid.

The meeting adjourned at 9.50 p.m. for the usual conversazione and examination of specimens.

[As this issue of the *Naturalist* is devoted to articles in connection with the Australian Nature Show, most of last month's notes and reports will be dealt with in later issues.]

THE NATURE SHOW AND YOUTH EDUCATION

(Resumé of talk to the Club on November 9, 1953, by N. A. Wakefield)

The 1953 Australian Nature Show, organized by the F.N.C.V. in the Prahran City Hall, was officially opened to the public by the Director of Education, Major-General A. H. Ramsay, at 4 p.m. on Tuesday October 20. The speaker was introduced by the Mayor of Prahran, Cr. C. S. Gawith, and Mr. P. Crosbie Morrison concluded the ceremony with some observations and words of thanks to Major-General Ramsay.

Detailed information about the show was published in the *Education Gazette* of September, 1953 and, as a result, a number of teachers made application and arranged for a total of about 2,000 scholars to attend. On the invitation of the Mayor of Prahran, a further 2,000 local scholars came along. All these were admitted free of charge, the show being reserved for these organized groups from 9 a.m. to 4 p.m. on each of the three days of its currency. Groups from the school for the blind were specially cared for by the stewards and derived a great deal of information and enjoyment from their visits.

General publicity was arranged for by notes in three consecutive issues of *Wild Life and Outdoors Magazine* and by an article in the scouts' journal; and several thousand brochures were distributed by the Council of Adult Education, Walking Clubs, Tourist Companies and members of the F.N.C.V. and other organizations participating in the show. The Prahran *Local* featured the function very prominently beforehand, and, immediately after the official opening, pictures and notes about the show appeared in the *Herald, Sun* and *Age*. Finally, most of the 6,000 printed guides to the show were taken home by those who attended, affording detailed information not only about the exhibits but of the Field Naturalists Club also.

Most of the public attendance was between 4 p.m. and 10 p.m. on the show days, and altogether about 1,500 people came during these times. On Tuesday, with its violent rainstorms, there were only about 200, but on Wednesday and Thursday evenings the hall was comfortably filled. The charge made for public attendance served to provide a small profit margin after covering the cost of production. The expenses included the getting together of a considerable amount of equipment which will be available for future shows.

The publicity policy was aimed at reaching and attracting people with at least the beginnings of interests in Australian flora, the aim being to produce a comfortable educational exhibition and present it to those who would profit by it, rather than to create a sensation and attract and amuse a large crowd of sight-seers. It was with the same respect for the dignity of the show that the member of the Anthropological Society in charge of their exhibit at the time, refused emphatically to allow a press photographer to take a picture which aimed only at sensation.

It was on the understanding that the exhibition aimed at education and was not a money-making concern, that the necessary co-operation was forthcoming from so many directions. The Prahran City Hall was made available free for four full days, Australian National Airways carried flowers at a considerable concession, and institutions not connected with the F.N.C.V. staged and manned three-quarters of the exhibits. If the primary aim of such a show were to be the raising of money, this Club could not expect the several government departments concerned to incur considerable expense in connection with it nor the numerous other societies to co-operate without some arrangement as to the sharing of profits.

In the past, the F.N.C.V. staged shows, the major part of which consisted of wildflowers, and large profits were made. Now, with the preservation of native flowers a major concern of the Club, such exhibitions

would be detrimental. Therefore there were no Victorian bush flowers at the 1953 show, but a striking display of garden-grown Australians, with the emphasis on their cultivation. Moreover, even though the government bodies and other societies provided the numerous attendants needed at their respective displays, the part that fell to the F.N.C.V. members to look after was often critically under-staffed. It was mainly due to the admirable efforts of the greatly over-worked few, that the setting-up and running of the show was completed with no serious break-down.

Such considerations caused the F.N.C.V. Council to allow a lapse of five years after the staging of the last show at Hawthorn, and to decide to attempt another exhibition only after considerable controversy. This too was the reason for the experiment with a new type of show. The various branches of nature each had their place, but emphasis was placed on the application of the naturalists' studies to the utilization and conservation of our natural resources. As a result of the broadened scope of the 1953 show and the different approach to it, the Victorian Education Department is taking considerable notice of the Club, and is ready to consider methods of co-operating to further the common aims of the two bodies.

This Club should now form a strong committee to consider future exhibitions. The present experimental effort can be improved upon, a smoother organization instituted, and a really outstanding show provided on the next occasion.

There is food for thought in connection with the attendance at the Nature Show, for though many thousands of adults were reached by the publicity campaign, only a very small percentage of these were interested enough to attend. Some questioning indicated that the greater proportion of those present had learned of the show through more than one channel; and *Wild Life* magazine had provided by far the most effective publicity. This meant that only those already interested in Australian outdoor pursuits were prepared to pursue those interests further rather than spend their leisure time at the ever-available amusements.

In the adult population there is a deplorably small percentage with appreciation of the vital problems in connection with nature knowledge and the preservation of our natural things. For this reason such organizations as the National Parks Association find a disheartening apathy, instead of enthusiastic co-operation, when they put forward their well-considered schemes for conservation.

But in the youth of this country we have abundant fertile ground, for they are athirst for knowledge and guidance. However, too little of the desirable seed is sown, not so much because of lack of effort by teachers, but because many willing teachers have not the knowledge and facilities necessary for the most fruitful efforts. There was a remarkable difference in attitude to the Nature Show by various school groups who attended. The majority of those brought en masse from the local schools, though satisfactorily entertained by the most spectacular of the exhibits, did not profit to any great extent educationally. But those from distant suburbs invariably derived great benefit from the show, for the teachers who were interested enough to arrange for their attendance had already sown the seeds of interest and enthusiasm in their scholars. We shall be taking a major step forward towards public enlightenment if we can assist teachers in connection with their nature studies at school.

Thirty or so years ago, the late Dr. J. A. Leach, an F.N.C.V. member and also an Education Department Inspector of Schools, laid the foundation by having nature study incorporated as a subject in the school curriculum. His book, *Australian Nature Studies*, is still the indispensable reference for the teacher of the subject. Furthermore, it is to the *Australian Bird Book* by the same author that the credit is due for the wide knowledge

possessed by this generation of Victorians of the birds of their State. This, together with the organization of the Lioold League of Bird Lovers, has eliminated the once widespread practice of egg-collecting. What has been done in the field of ornithology can be done also in other branches of nature.

It is suggested that the F.N.C.V. organize a Nature League, with the approval of the Education Department, in Victorian schools. Units of this could exist in individual schools or grades, each under the care of an interested teacher, with an F.N.C.V. committee to place at their disposal much that would facilitate school nature study. For a very small subscription, each member scholar could receive a small monthly publication containing informative pictures and notes, resumés of books, etc., suitable for school libraries, arrangements for identification of specimens for the class museum, suggestions for excursions to places of natural interest, and the organization of correspondence between country and city groups.

The Victorian Education Department has a small number of nature text books for free issue to its schools, and with its future publications this Club should seek departmental acceptance for the same purpose. The forthcoming revised edition of *Victorian Ferns* should be an excellent example of the type of book needed—with every known Victorian fern species well illustrated and dealt with in simple language, durably bound, and priced at less than normal cost of production. A series of such handbooks should be available for the use of teachers and students of nature study.

For those who leave school with a suitable foundation laid, the continuation of natural history interests should be catered for by Junior Naturalists Clubs such as that which has functioned at Hawthorn for a number of years. The foundation of a club of this nature is being considered at Ivanhoe, and in the very near future another is to be inaugurated at Prahran, where the progressive City Council with its excellent Children's Library facilities will lend every support to the movement.

The objects of the F.N.C.V. are "to promote the study of and stimulate interest in all branches of Natural History, and to preserve and protect fauna and flora"; so we should consider these movements for youth education very deeply, for their successful operation will produce a generation of adults with a far greater appreciation of Nature, and a vital interest in the intelligent utilization and conservation of Australia's resources and the preservation of our natural wonders.

EXHIBITS AND EXHIBITORS AT THE NATURE SHOW

For the purpose of putting on record the F.N.C.V. Show for 1953, various of the exhibitors have contributed articles for this issue of the *Naturalist*. The resulting booklet provides a fairly comprehensive survey of the exhibition, an insight into many activities of the institutions concerned, and some interesting facets of the question of public education. The eight photographs reproduced in this issue were taken by Mr. Mervyn H. A. Thomas.

The twenty-six main exhibits were as follows:

1. CULTIVATED NATIVE FLORA AND WILDFLOWERS. from Naturalists Clubs throughout Australia and from local and interstate gardens.
2. FIELD NATURALISTS CLUB OF VICTORIA: PUBLICATIONS AND INFORMATION.
3. HOW OLD IS AUSTRALIA?—By the F.N.C.V. Geology Group.
4. SEA-SHELLS—By members of the F.N.C.V.

5. ENTOMOLOGY: BUTTERFLIES, BEETLES, ETC.—By the National Museum of Victoria
6. PHOTOGRAPHY: A series by Howard Hughes, A.R.P.S., of the Australian Museum, Sydney.
7. WORK OF JUNIOR MEMBERS OF THE GOULD LEAGUE OF BIRD LOVERS.
8. ACTIVITIES, PUBLICATIONS, etc., of the Bird Observers Club, and a record of the work of the Altona Survey Group.
9. BIRD PHOTOGRAPHS and PUBLICATIONS—By the Royal Australian Ornithologists Union.
10. SURVEYING and MAPPING, PROSPECTING and ASSAYING, VICTORIAN ORES and METAL PRODUCTS, and the GEIGER COUNTER in operation—By the Department of Mines.
11. SOME AUSTRALIAN WATTLES—By the F.N.C.V.
12. NATIVE PEOPLES OF AUSTRALIA AND NEW GUINEA, PAST AND PRESENT—By the Anthropological Society of Victoria and the National Museum.
13. MAPS AND PHOTOGRAPHS OF AUSTRALIA'S SOUTHERN DEPENDENCIES—By the Antarctic Division, Department of External Affairs.
14. EROSION DEMONSTRATIONS, MODELS AND PICTURES—By the Soil Conservation Authority.
15. RELIEF MODEL, FOREST TYPES, ETC., OF THE DANDE-NONG RANGES—By the Save the Dandenongs League.
16. PROPOGATION FOR RE-AFFORESTATION—By the Natural Resources Conservation League.
17. THE BUSHFIRE MENACE—By the Forests Commission of Victoria.
18. LIVE MARSUPIALS, PARROTS AND LIZARDS—By the Zoological Board of Victoria.
19. DEMONSTRATIONS WITH VENOMOUS SNAKES—By members of the F.N.C.V.
20. WOOD-DESTROYING FUNGI and the STUDY OF EUCALYPTUS BARKS—By the Forests Products Division of the C.S.I.R.O.
21. COMBATING THE FRUIT-FLY—By the Department of Agriculture.
22. EMBROIDERY, WITH AUSTRALIAN FLOWER MOTIFS—By Thelma Crawford, Melbourne.
23. MARINE LIFE—By members of the F.N.C.V.
24. ENTRIES IN THE NATURE PHOTOGRAPHIC COMPETITION—Organized by the Federation of Victorian Photographic Societies.
25. COLD WATER AND TROPICAL FISH—By the Aquarium Society of Victoria.
26. INSECT PESTS—By the Microscopical Society of Victoria.

**DIVISION OF FOREST PRODUCTS
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH
ORGANIZATION**

By A. J. WYMOND*

The Division of Forest Products, of the Commonwealth Scientific and Industrial Research Organization, was formed in 1928 to carry out investigations on Australian timbers, and to give direct assistance to all concerned with wood utilization.

A major aspect of its work is the more effective use of forest resources by reducing waste in forest, mill, and factory; by reducing losses from decay and insect attack; and by a study of the relationship between silvicultural treatment and timber properties.

In the Sections of Wood Structure, Wood Chemistry, Timber Physics and Timber Mechanics, the emphasis is on basic investigations, though applied problems are also covered. In the other four Sections, Timber Seasoning, Wood Preservation, Veneer and Gluing and Timber Utilization, applied problems comprise the more prominent part of the work, but basic investigations are also carried out. Facilities available in the Division include a comprehensive library, covering all aspects of forest products research, and well-equipped workshops.

In its early years, the Division occupied temporary accommodation at the Headquarters of the then Council for Scientific and Industrial Research at Albert Street, East Melbourne, but soon established its importance sufficiently to warrant a home of its own, and in 1936 moved to its present laboratories in Yarra Bank Road, South Melbourne.

At the recent Australian Nature Show, some features of the Division's work were illustrated.

The exhibit was divided into two sections, one dealing with wood destroying fungi, and the other with timber identification problems.

Early this year the Division called for assistance from foresters, naturalists, school-children and the general public, in the collecting of fruiting bodies of wood destroying fungi. These were needed to provide cultures to test the natural durability of timbers, the durability of preservative-treated timber, and to identify wood destroying fungi in the laboratory.

The fungi shown represent all the more important genera of wood destroying fungi, and many of them were sent to the Division by interested persons.

The specimens chosen were those most typical of their species, in size and other characteristics, but many of them are capable of growing to a much greater size.

The sloping panel below the fungi gives practical examples of how the mycological work is carried out.

On the extreme left several samples of decayed timber are shown. Decay causes the loss of many millions of pounds worth of timber every year, and the search for new and better wood preservatives is continually going on.

In order to identify the fungus responsible for decay of a piece of timber, where no fruiting body can be found, a culture is made from the timber, and the growth is compared with cultures grown from known fungi. By this means the unknown fungus may be identified. Another method is to grow a fruiting body of the unknown fungus and compare it with named fruiting bodies, however this is very difficult to do with most species.

Cultures from known species of fungi are widely used in the laboratory to test the natural durability of various timber species, also to test the effectiveness of various wood preservatives.

Two common types of test are shown. In the first case, blocks of the

*Information Officer, Division of Forest Products, C.S.I.R.O.

same species, some treated with preservatives, and some untreated, are tested by exposure for some months to an active wood destroying fungus. The blocks rest on moist soil in a culture jar from which all other fungi have been carefully removed. Under these conditions the untreated blocks rot completely, and some decay occurs in all but the most effectively treated blocks.

In the second case, the technique is the same, but the test is being used to determine the natural decay resistance of different timber species.

The right-hand half of the Division's exhibit deals with the identification of eucalypt timbers. The lower section shows the five main groups of eucalypts, based on the bark characteristics. These are—(a) the Gum group—the old bark peels off periodically, leaving a typical smooth surface; (b) the Stringybark group—thick soft fibrous bark which tears off easily; (c) the Box group—semi-fibrous type of bark with shallow fissures tending to form flakes; (d) the Peppermint group—semi-fibrous type of bark, intermediate between box type and stringybark type; (e) the Ironbark group—very hard deeply fissured bark often with dark coloured deposits.

This grouping is useful to the forester and naturalists, but it obviously cannot be applied to sawn timber which requires a somewhat more detailed examination.



One macroscopic method of identification is based on the Division's card sorting key, which covers all the more common Australian timbers. The equipment needed, in addition to the key, is simply a sharp knife and a 10x lens. The general features of colour, hardness and weight are noted, and a clean cut is made on the end surface with a sharp pocket knife. The cut is then examined with the lens for distinctive features which are sorted using the card sorting key. By this means, with a little practice, the species can usually be determined. The system, however, has its limitations and sometimes will not distinguish between closely related species.

The microscopic method can then be used. This is essentially a laboratory method, in which very thin sections of the wood are cut on a microtome, mounted on glass slides, and studied in great detail using a microscope. A much more accurate identification is possible using the features of structure thus revealed.

Enquiries relating to this exhibit, or to any matters concerning forest products generally, may be addressed to the Chief, Division of Forest Products, C.S.I.R.O., P.O. Box 18, South Melbourne

MINES DEPARTMENT OF VICTORIA

[Report contributed by the Department for the *Victorian Naturalist*.]

Though crystallized as one compact instrumentality, the Mines Department presents on inspection many facets, each contributing in its own way a vital service to the people of Victoria. The Department to-day embraces scientific, administrative, and technical work, and it was the purpose of the Department's exhibit to present to the public a few features of some of these activities.

The first panel of the exhibit listed the Department's chief functions—Administration, Geological Survey, Inspection of Mines and Quarries, Inspection of Boilers and Pressure Vessels, Drilling, and Laboratory Research.

The second panel further developed this theme by describing the functions of the Branches not elsewhere covered: the Administrative Branch which protects the legal rights of miners and the general public with regard to mining, and controls the issue of leases and licences for all types of mining activity and the collection of royalties on minerals; the Mines Inspection Branch which supervises safe working and health in all mines and quarries throughout the State, eliminating potential sources of accidents and of conditions which would cause miners to fall victim to such occupational diseases as pneumoconiosis; and the Boiler Inspection Branch which ensures the correct and safe design as well as proper care and maintenance of boilers and other pressure vessels in the State.

Also displayed on this panel were a few of the pamphlets which the Department makes available to school students to assist them with their projects.

Then followed the story of Drilling: to help combat the nation-wide shortage of raw materials, the Mines Department has undertaken a comprehensive exploratory programme in connection with the development of mineral resources. Mobile modern equipment has been acquired to advance this programme and seven drilling units are in continuous operation. These include percussion, diamond and rotary rigs, some capable of drilling to a depth of about 2,000 feet.

The panels explained first why drilling is necessary, listed the chief types of drills, and then by photographs and actual samples demonstrated the sequence of operations of drills in action.

Special attention was given to the rotary drill, the most generally useful. An American Army publication, "Well Drilling", defines rotary drilling as follows: "Rotary drilling requires a cutting tool or bit, a means of imparting the rotary motion to the tool, a means of maintaining bit pressure against the material being cut, and a means of removing the material displaced by the bit."

In rotary drilling the material displaced is removed by the circulation, down the drilling rods and up the sides of the hole, of a gas or liquid, generally mud. Or, when a sample or "core" of the material being penetrated is required intact, for inspection or analysis, then a special coring bit is used which cuts out and traps a cylindrical section of the material. The exhibit displayed actual drilling and coring bits, and cores recovered by the Department's rigs at depths down to 1,500 feet.

Apart from locating and defining deposits of coal and other economic minerals, and providing samples for analysis, drilling work is of great importance to the Geological Branch as it provides information as to the geological structures of certain areas and so speeds up the finding of new deposits.

The central feature of the whole display was a revolving rotunda which carried on its tiers samples of Victorian minerals and their industrial

products, surmounted by a working scale model of a rotary drill. The model drill related the rotunda to the previous part of the exhibit and to the work of the Mines Department generally, whose broad function it is to promote the safe and efficient winning of these typical Victorian minerals—brown coal, kaolin, gypsum, limestone, antimony, etc.

Beside each mineral was set a sample of its chief industrial product—such as plaster of Paris from gypsum, and cement from limestone—in order to bring home to us how much we depend upon our mining industry for ordinary daily needs and amenities.

To provide a topical note, the rotunda also carried a sample of uranium ore. As this sample approached a Geiger Counter alongside the rotunda, the "clicks" emanating from the instrument's loudspeaker increased in frequency, and then diminished as the specimen of uranium ore receded from the Geiger Counter, thereby illustrating vividly a subject much in the news—prospecting for radio-active minerals.



Central Section of Mines Department Exhibit.

The next panels presented aspects of the work of the Department's Laboratory, which performs the chemical investigations necessary to determine the composition and economic value of specimens provided by the Department's Drilling and Geological Branches, or by prospectors or members of the mining industry. This work embraces the assaying of metalliferous and auriferous ores, the analysis of coals and other minerals, the fire-testing of clays to determine their suitability for brick-making and pottery purposes, the classification of rocks and minerals, and—to advance safety and hygiene—the analysis of mine air.

Typical work was illustrated by showing the steps in assaying a gold ore and in fire-testing a clay. The techniques employed were made as graphic as possible by showing actual samples—from the weighing of the gold ore as received to the weighing of the pure gold extracted from it, and from the moulding of the clay as received to examples of its behaviour after being fired at high temperature.

Then lastly, came the Geological Survey unit: The scope of the mining operations for Victorian minerals is a wide one, and embraces a great deal of geological investigation. The geological staff carries out surveys of the various mines and geological structures of the State, adding continually to

the information available on the gold reefs, the coal areas, and the other mineral deposits. Apart from the search for minerals, geological advice is frequently sought in relation to major developmental works such as dam construction.

Photos illustrated the field geologist on the site, no matter how rugged the terrain, gaining the all-important first-hand information and collecting rock specimens, and the palaeontologist, petrologist and other specialists examining and correlating these specimens with regard to composition, crystal structure, fossil remains and so on, leading to the preparation of a base map.

The last panel dealt broadly with the work in producing a geological map, towards which geological work is principally directed and from which information vital to a wide variety of industries and sciences can be deduced. The Draughting Branch carries on from the work of the geologists to the production of the finished geologically-coloured map.

Aerial photographs are used extensively by the Mines Department for geological interpretation and for the compilation of the new standard map series. Included in the display was a stereoscope mounted over a stereoscopic pair of aerial photographs of Mt. Difficult in the Grampians, so that the public could see the third-dimensional effect obtainable by this technique which enables the draughtsman, using stereo-plotting machines, to plot contour levels.

A sample geological map, embodying the results of so much detailed and expert work, concluded the exhibit.

These, briefly, are the Department's main activities. Other work includes the filling-in of dangerous abandoned mine shafts with a bulldozer, the operating of State crushing batteries at various country centres to serve the needs of prospectors, the rationing of fuel supplies through the State Coal Committee, the maintenance of a Geological Museum for those who desire to examine the actual products of mining and the various kinds of minerals that are obtainable in the State and in other parts of the world, the regular issue of mineral statistics, and the publication of scientific reports, handbooks for prospectors, and the periodical Mining and Geological Journal which provides an up-to-date coverage of mining and geological activities in Victoria.

In all these ways, the Mines Department of Victoria functions for the development and utilization of our natural resources.

FORESTRY IN VICTORIA

[Report contributed by the Forests Commission for the *Victorian Naturalist*.]

The history of the control of forests in Victoria, until the formation of the Forests Commission in 1919, is a chequered one. Prior to this date, forestry had been a Cinderella department, forming, at various times, a branch of the Departments of Mines, of Lands, and of Agriculture—seldom remaining very long under any one of them.

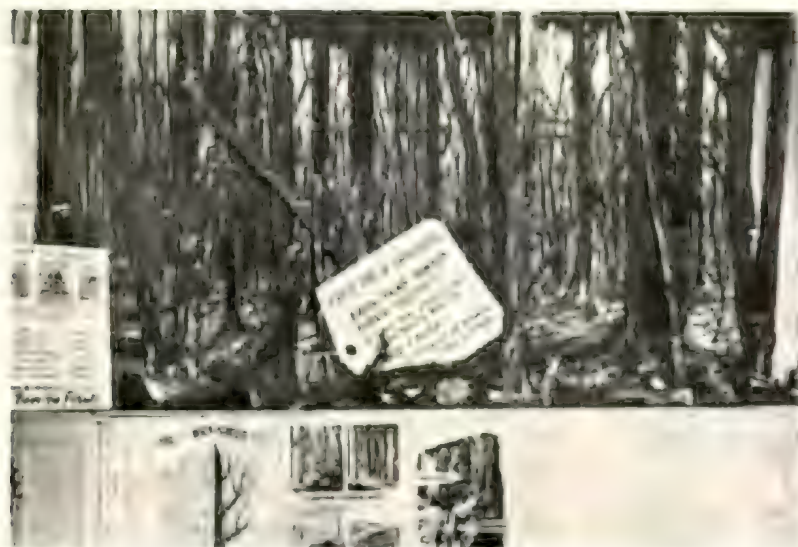
In the last century, huge quantities of valuable timber were destroyed during the years of intensive gold mining and land settlement. Large tracts of forest-bearing Crown Lands, often obtained under political pressure, were ruthlessly cleared by ring-barking and fire, regardless of their suitability or otherwise for agriculture. Although great efforts were made by those who realized the potential value of our forests, the frequent changes of control had a disastrous effect by destroying that continuity of management so essential to forestry.

Faced with this legacy of mismanagement and abuse, the Forests Commission planned and implemented a vigorous policy to repair the damage done to one of this State's most valuable assets. Scientific forestry

and modern equipment are to-day achieving the aims of the Commission—the conservation, development and utilization of indigenous hardwoods, and the establishment of adequate softwood plantations.

Professional field staff to carry out this vital work is trained at the Victorian School of Forestry, Creswick, a well-equipped residential college with ample facilities for practical instruction in all aspects of forestry. Following a three-year course at the School, officers may proceed to take a Science Degree in Forestry at the University of Melbourne.

Four main nurseries and numerous smaller ones are maintained by the Commission to supply seedlings for their own planting programme, and for distribution to rural areas for re-forestation and shelter planting. The Commission's ultimate objective in softwood planting is 250,000 acres, of which more than 40,000 acres have already been established.



Forests Commission Exhibit at the Nature Show.

The campaign against fire has been greatly intensified over the last decade. An adequate fire law and stricter supervision by forest officers, the use of aircraft, modern heavy earth-moving and fire-fighting equipment and the installation of a highly efficient radio communication service, have done much to reduce the threat of a repetition of the horror of 1939. Nearly 8,000 miles of forest access roads have been constructed by the Commission's engineering branch, opening up a considerable amount of country previously inaccessible. Many observation towers have been erected and are constantly manned during the fire season. Reports are flashed through the Commission's radio network to the central station, V.L.3 A.A., at head office and operations are co-ordinated and directed from there.

Progressive development of scientific forest management in Victoria is essential—not only to ensure adequate timber supplies but also to safeguard and conserve water supplies and maintain, as a continued source of inspiration and recreation, to the people, the limitless beauty of our forests.

NATURAL RESOURCES CONSERVATION LEAGUE OF VICTORIA

[Extracts from the League's First Annual Report, which is the Ninth Annual Report of the "Save the Forests" Campaign, by C. E. ISAAC.*]

The League came into existence officially on January 1, 1952, taking over the assets and liabilities of the "Save the Forests" Campaign Council. The campaign is being continued by the league with the same membership and under the direction of an Executive Committee elected in the same way as the Executive of the former Campaign Council.

For more than a hundred years we have been cutting down or ring-barking trees by the million. We have cleared thousands of square miles of country in water catchment areas that should never have been cleared. Fires also have depleted our timber resources. In 1939 the most disastrous forest fires on record in Victoria almost wiped out the valuable Mountain Ash forests of this State.

These fires made public understanding of the seriousness of the position imperative. The chairman of the Forests Commission said—

"No matter how strictly fire prevention laws are enforced the sympathy and support of the people will never be obtained in the absence of education. It is firmly believed that in public education lies the key-stone to fire prevention in this State."

The chairman of the State Rivers and Water Supply Commission said—

"The limiting factor in the development of Australia will one day prove to be the limit of her water resources. *Afforestation and water supply go hand in hand.* It is a grave reflection upon our times that conservation of our resources receives so little attention."

An intensive education campaign to save the forests, in which every tree lover could take part, was becoming an urgent necessity. With this background the "Save the Forests" Campaign was started early in 1944.

The purpose of the "Save the Forests" Campaign was laid down at its inaugural meeting in the Melbourne Town Hall on 27th January, 1944. It was: "To impress on the people of the State the fundamental importance of forest preservation in relation to the timber, soil and water resources of Australia". This will continue as the prime objective of the Natural Resources Conservation League.

In the first three years of the "Save the Forests" Campaign finance was provided by donations only. In 1947 a direct Government Grant of £715 was made. This was increased the following year to £2,000 and has since risen to £5,000. In 1951 a small charge was made for trees supplied for farm use apart from 30,000 trees supplied free of charge to Soldier Settlers. Income for the years 1944 to 1952 is as follows: 1944, £1,605; 1945, £1,707; 1946, £1,810; 1947, £2,233; 1948, £3,730; 1949, £6,455; 1950, £6,679; 1951, £10,434; 1952, £10,633.

Associations to awaken interest in forests and tree planting have been formed over the past fifty years in all States. Some of them are still active but their membership has never exceeded a few hundreds. The new campaign needed thousands. A plan capable of enlisting the support of thousands was devised. Instead of forming a new association with its own membership the plan adopted was to *co-opt* the membership of existing organizations interested in community service. The plan was immediately successful.

The "Save the Forests" Campaign has had practically no direct individual membership but its "co-opted" membership exceeds 400,000 which is the aggregate membership of the organizations represented on the Campaign Council and, now, on the League.

*Honorary Director, Natural Resources Conservation League of Victoria, Springvale Road, Springvale South.

It is not expected that all of the members of an affiliated organization will take an active interest in the objectives of the campaign, but a surprisingly large number of the members of some organizations actually do so. Amongst these are the Country Women's Association and the Returned Servicemen's League in which literally thousands of members take a personal interest in forest preservation and tree planting. Country municipalities also are becoming a mainstay of the movement.

Tree planting activities serve the dual purpose of directly helping reafforestation and assisting to retain the interest of those who wish to do something of practical value in association with the campaign.

The Campaign's Research Nursery was started in a small way in 1946. In each succeeding year larger quantities of trees have been grown and in 1952, in spite of severe losses through excessive rain, 100,000 trees were grown and distributed. It is expected that this number will be doubled in 1953.



The League's exhibit at the Nature Show, illustrating the method by which trees are raised for distribution. The steps are: (a) Seed saving, (b) Seed sowing, (c) Tubing small seedling trees, (d) Caring for newly tubed trees, (e) "Hardening off" trees in tubes, (f) Planting out and caring for advanced trees. The steps were described in detail on large wall panels, and the table and floor space was taken up with actual examples of each stage. Officers were in attendance to demonstrate the tubing process and supply information.

Australian trees constitute 90 per cent of the total grown, and of these eucalypts of value for timber and stock protection form the greater part. Species of proved value are grown in greatest number, but less well known kinds are supplied to Soldier Settlers and others in various parts of the State with a view to widening the selection for roadside planting, community forests and farm use.

Amongst educational activities which have been used to influence and inform public opinion are: Leaflets and circulars of information, field days and demonstrations, the screening of educational films, exhibits at the Melbourne Royal Agricultural Show and at district shows, visits by the Campaign Field Officer, and a series of broadcasts over several years. There is ample evidence that the public is better informed and more interested in forestry, especially in relation to timber, soil and water conservation than it was when the campaign was started.

THE FRUIT FLY CAMPAIGN

By F. M. READ, M.AGR.SC.*

Although Queensland Fruit Fly (*Dacus Tryoni*) has been present in the sparsely populated eastern extremity of Victoria for some years, its occurrence in fruit of one Gravenstein apple tree in the Melbourne suburb of Surrey Hills in January of this year was the first record in any other part of Victoria.

Immediate examination of several hundred gardens within a radius of the occurrence failed to disclose further evidence of its presence, but it was decided nevertheless, in view of the nature of this pest—one of the worst of fruit pests—and the proximity of important fruit-growing areas to Melbourne that vigorous steps should be taken to eradicate it. The measures decided upon conform generally to those which have been adopted successfully at Sale, in East Gippsland and in Adelaide, in recent years.

As a result of wide press publicity, some two thousand specimens of suspected fruit fly were submitted by the citizens of Melbourne, and within a fortnight fruit fly was identified in five other suburban gardens, one in Box Hill, two in Toorak, one in East St. Kilda, and one in Beaumaris. The fruits concerned were nectarines and peaches, except in the Box Hill and Beaumaris cases, where adult flies were found in the houses and were considered to have originated in apricots grown in the gardens of these properties. Residents recalled having seen maggots prior to the press publicity. Of these cases all were Queensland Fruit Fly, except that at Beaumaris which was identified as Mediterranean Fruit Fly (*Ceratitis capitata*). In all cases, as at Surrey Hills, only a single tree was affected and these trees were separated by a distance of two or more miles, except the two infested trees in Toorak, which were about one-third of a mile apart.

After the lapse of a month, during which, despite the continued active search by householders and the Department of Agriculture, no further cases of fruit fly were detected, four occurrences in apples were recorded in mid-March—one in Hawthorn, one in Essendon and two about three hundred yards apart in Windsor. These cases, like the others, were isolated, single-tree infestations.

The only country case brought to light by this intensive search was at Longwood, a small township about 90 miles north of Melbourne, on the Hume Highway. There are two commercial orchards separated by a distance of about a mile at Longwood and about a score of widely spread farm homesteads. Fruit fly occurred in nectarines on one orchard, but no evidence of its presence was detected on the other properties.

Under the provisions of the Vegetation Diseases (Fruit Fly) Act, an area around each point of infestation was proclaimed but these have now been rescinded. In the suburbs a proclaimed area embraced all land within a mile of the point of infestation. Within this area the planting of tomato, pepper, egg plant, ornamental solanum, rock melon, sweet melon, cucumber, and cape gooseberry was prohibited. The removal of fruit from the proclaimed area or from any property within it to any other property was also prohibited.

Stripping and disposal of fruit, although required of the owner under the Proclamation, was carried out, on their behalf, by teams employed by the Department of Agriculture. During the fruit stripping, prohibited plants were also removed and disposed of by placing in a deep quarry and, after applying D.D.T. dust equivalent to not less than $\frac{1}{2}$ oz. per square yard of actual D.D.T., covering the fruit with not less than three feet of consolidated soil.

Only the central part of the proclaimed area, embracing properties with-

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in half a mile of the point of infestation, was stripped, first to dispose of any other fruit which might already be infested, though undetected, in the vicinity of the occurrence, and secondly to remove all suitable fruits in which the fly or flies responsible for the observed outbreak could lay further eggs during their lifetime, which may be up to several months.

In addition to stripping, all gardens in the suburban proclaimed areas were sprayed by Departmental teams on behalf of householders.

As a total of about 120,000 property sprays were applied, the organization of this spraying work was no light task. It involved the hiring of 48 trucks on which were mounted power spraying machines loaded by or hired from orchardists in the districts nearer to Melbourne.

The first spray, applied here and there in gardens within a quarter to half a mile of the infestation, was a tartar emetic and sugar bait spray, in the hope that flies would be attracted to them and poisoned. A good deal of this work was carried out by men working on foot using knapsack sprays.

Power sprays followed with 0.2 per cent D.D.T. at regular intervals up to mid-May.



Fruit Diseases Exhibit at the Nature Show

The purpose of the D.D.T. spraying over this protracted period was to kill the adult fly by contact as it moved from tree to tree or plant to plant in its search for fruit in which to lay its eggs.

At Longwood, both commercial orchards and all other fruit trees within a mile of the infestation were stripped and sprayed, on a similar plan to that described above, by the orchardists under the supervision of the Department.

The inspection of fruit coming into Victoria commercially from the northern States has, for many years, been very stringent, involving inspection of each individual fruit and the repacking of all consignments from districts where fruit fly occurs. The recent and prospective further speeding up of interstate railway schedules for goods trains on which fruit is carried is reducing the time between fruit picking in the northern States and inspection in Victoria. Thus fruit tends to reach us when the insect is in an earlier stage of development and consequently more difficult to detect. Much thought has been given by the inspection staff to this problem but it is possible that affected fruit in an early stage of attack may slip through occasionally. It is the responsibility of wholesale and retail merchants and the

public to watch for any signs of such infestation and report it. It is, however striking that in fact, at no time has infested commercial fruit been brought to the notice of the Department.

A more probable source of infestation is thought to be fruit brought in privately by travellers, and although the Department has for some years been giving publicity through posters, wireless statements, and the press to draw the attention of travellers to this risk, the valuable press publicity given throughout the campaign unquestionably assisted in bringing home to travellers the good reasons why they should not bring fruit from northern States into Victoria.

The distribution of posters and folders on fruit fly is being continued, and road signs have been placed, in co-operation with the Country Roads Board, along the Hume Highway and other roads leading from New South Wales. To keep Victoria free of this pest will require continued vigilance on the part of Departmental officers and a continuing appreciation by citizens of their responsibility to see that they do not inadvertently introduce this pest by bringing fruit through channels where it cannot be carefully inspected by the Department's fruit inspection branch.

SOIL CONSERVATION AUTHORITY

[Report contributed by the Authority for the *Victorian Naturalist*]

This authority was constituted in 1947 and charged with "the prevention and mitigation of soil erosion," "the promotion of soil conservation" and "the determination of matters relevant to the utilization of all lands—". The authority's activities cover surveys and investigations of erosion, the determining and carrying out of conservation and reclamation works, advice to landholders as to such works and their supervision, and the co-ordination of policies and activities of public authorities dealing with the occupation and utilization of lands.



Exhibit at the Show

The Soil Conservation Authority's exhibit at the Nature Show demonstrated that vegetation provides the best possible protection to the soil. This was shown very clearly in a model of a reservoir and its catchment. On one side of the reservoir, the country had been subdivided into several farms and completely cleared of its protective tree cover. In the following

years it had been heavily grazed by stock and rabbits, resulting in complete loss of the soil and heavy siltation in the reservoir. On the opposite side, the forest had been retained on the upper slopes and farmland on lower country had been protected with improved pasture and careful grazing management. Run-off into the reservoir from this side was clear of silt.

A second model demonstrated that the splash of pounding raindrops on bare soil picks up small particles of soil and the water is immediately turned into mud, but vegetation, either growing or dormant, provides a protective carpet over the soil, breaking the pounding effect of the raindrops and enabling the water to pass over or into the soil without disturbance. This was simply and effectively shown by water dripping on a revolving disc of soil, half of which was protected by a covering of grass and the other bare half of which was rapidly washing away.

ZOOLOGICAL GARDENS

By JOYCE SEECAMP*

The Nature Show exhibits from the Zoological Gardens were most popular, especially with the children. They included a young Wombat, two Silver-grey Possums—one an Albino type, three Lesser Gliders or Sugar Squirrels, several varieties of Parrots, Spinifex Pigeons and Lizards.

The show was stolen by "Wombec" the Wombat. There is quite a story attached to this popular character. One night, about 18 months ago, a "New Australian" truck driver was travelling along a Gippsland highway, when he felt the truck hit something on the road. He got out to investigate, and found that he had, unfortunately, killed an animal of a species unknown to him. He took the carcass to a family at Moe, who identified the creature as a Wombat. While examining the carcass, a little pink foot protruded from the pouch, and the baby was removed from the dead mother.

This family at Moe looked after the young one for a few months, and on their next visit to Melbourne, brought "Wombec" along and presented him to the Zoo, where he continued to receive the same good care and attention as his adopted "family" had given him.

Many "orphans" are brought to us under similar circumstances. Young birds who have fallen from the nest, baby Wallabies, Kangaroos, Possums—beautiful little creatures whose fate would be a slow death from starvation after the mother's death, if an interested person did not investigate and rescue them.

It is gratifying to see the acceptance of human foster parents by young animals. The care and attention given them is repaid in the reciprocation of affection.

These animals live out their lives peacefully at the Zoo in surroundings comfortable to them and attractive to visitors. The picture of Kangaroos grazing contentedly in grassy paddocks or lying under shady trees is one which appeals to lovers of nature.

A large aviary, dense with trees and shrubs, resembling a miniature Australian forest, houses Spinifex, Bronze-wing and Wonga Wonga Pigeons, Diamond Doves, Zebra, Gouldian, Pictorella, Red-browed and Black-heart Finches, Brown, Stubble, King and Painted Quail, many of which breed. Also, Bower Birds build their bowers in this enclosure.

The Zoo offers many opportunities for the observation of the habits of Australian and exotic animals, and organized excursions by parties of naturalists and students are particularly welcome.

*Public Relations Officer, Zoological Gardens, Parkville, Victoria.

ANTARCTIC DIVISION, DEPARTMENT OF EXTERNAL AFFAIRS

By A. CAMPBELL-DRURY*

One of the main concerns of the Division is the organization of the Australian National Research Expeditions. Each year since 1947, parties of scientists and technicians usually numbering about fourteen men, have left Australian shores to endure twelve months of isolation on Heard and Macquarie Islands in the sub-Antarctic. For the benefit of mankind generally, they do battle with the elements—the wrath of the winds, the incessant blizzards and the bitter cold. The wooden huts in which they live and work and store their modern equipment, are of prefabricated construction securely lashed down to the ground with steel cables and designed to withstand the worst weather the Antarctic can provide.

The meteorological stations on these two islands have been carrying out continuous observations over the past six years to provide data about the weather from that part of the earth where storms which blast the southern states of Australia originate. Radiosonde and Rawin equipment is being used to measure the temperature, humidity, pressure and wind velocity in



Antarctic Division Display at the Nature Show

the upper atmosphere, 50,000 feet above the earth's surface, and this information is radioed to Australia daily.

Radio-physicists, Geophysicists and Cosmic-ray scientists are reaching out into space from these southern latitudes to find out more about the upper atmosphere and auroral phenomena which have a very important bearing, amongst other things, on the propagation of radio transmissions throughout the world.

Here too, biologists are learning more about the flora and particularly the fauna in these regions where such extensive research has never been previously undertaken. Bird-ringing and seal-branding are enabling them to study migratory habits.

The Photographic Section of the Antarctic Division has a unique collection of photographs and films in its files, amassed over the years, which are constantly being drawn upon by interested bodies everywhere and distributed far and wide to educate the world on the part Australia is playing

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in the far south. A fine exhibition of Antarctic photography has recently been shown in Australia, America and the United Kingdom to further this end, and through the medium of photography and the writings of the scientists employed by the Antarctic Division, many reports are being evolved which find their places on the shelves of every noteworthy scientific society throughout the world.

A number of these Antarctic photographs, along with specimens of King and Rockhopper penguins, were exhibited at the Nature Show of the Victorian Field Naturalists Club last October, and in this way the general public and thousands of school children from whose ranks members for future expeditions will be drawn, were thus afforded an excellent opportunity to learn something about their country's Antarctic environs.

In January of next year, Mr. P. G. Law, Director of the Antarctic Division of the Department of External Affairs, intends landing a wintering party of ten men on MacRobertson Land in the Australian sector of the great Antarctic Continent which for so long has hidden its secrets. In some parts of this vast icy wasteland there exist mineral deposits which will one day be used by a world whose mineral and fuel supplies have a very definite limitation.

NATURE PHOTOGRAPHIC COMPETITION

Following an approach by the Field Naturalists Club of Victoria to the Victorian Association of Photographic Societies, it was decided to conduct a Natural History Photographic Competition which, after judging, would be displayed at the Annual Exhibition to be held at the Prahran City Hall.

Publicity was given in various magazines and papers; this club sent notices to its various correspondents, and the V.A.P.S. circulated every camera club and photographic society in the Commonwealth and New Guinea, resulting in a total of eighty-three entries being received.

The results of the competition were as follows:

FIRST PRIZE of £5/5/- (donated by the Field Naturalists Club of Victoria). "Skua Gull and Chick" by Mr. W. R. J. Dingle of the Weather Bureau, Melbourne.

SECOND PRIZE of £3/3/- (donated by Camera Supply Co. Pty Ltd., Melbourne). "Shindy in the Shallows" by Mr. A. V. Potts of Langhorn's Creek, South Australia.

THIRD PRIZE of £1/1/- (donated by Victorian Association of Photographic Societies). "Bull Seals Fighting" by Mr. F. Lewis of 2 Denham Place, Toorak.

The judges, who were considerably impressed with the high standard of the work, were:

Mr. P. Crosbie Morrison, B.Sc., Editor of *Wild Life and Outdoors*.

Mr. E. R. Rotherham, nature photographer and overseas exhibitor.

Mr. Edwin G. Adamson, A.R.P.S. Photographer.

The judges are to be complimented on their awards, for the making of their decision was by no means easy. In a competition such as this, there is far more than technical excellence and pictorial composition to be considered. The rarity of the subject photographed, the practical difficulties to be overcome, the need for great patience and many other factors must all be given consideration before a just decision can be made.

Of the eighty-three entries received, three, in addition to the prize winners, were highly commended by the judges, and altogether fifty-two will receive the Photographic Association's Sticker as an award of merit.

The success of the competition has resulted in a decision being made to conduct one annually, and the experience gained in the one just completed will be a valuable guide for the future.

—N. B. CROUCH, Hon. Sec., V.A.P.S., 15 Denver Cres., Elsternwick.

THE EXHIBIT AND THE ACTIVITIES OF THE ENTOMOLOGY DEPARTMENT, NATIONAL MUSEUM OF VICTORIA

A. N. BURNS, M.Sc., F.R.S.*

A total of twelve cases was exhibited, and an endeavour made to make the exhibit as comprehensive as possible combining attractive and interesting features as well. Naturally in doing this such insects as colourful Butterflies and Moths were foremost; these were supplemented with some large Beetles, Stick Insects, and Cicadas.

The last were well-known Australian species represented by some of the larger and well known forms. Cicadas are often quite wrongly referred to as Locusts to which they are not really in any way related. It is only the male Cicada which "sings", and in a favourable Cicada season their constant shrilling is a familiar sound in the Australian bush during the summer months. Cicadas have a life history lasting over a period of years. One American species takes no less than 17 years to become adult and live an aerial existence of a few weeks only! Just how long our Australian species take to develop to maturity is not yet definite, but it is believed that the Common Green Munday (*Cyclochila australasica* Don.) spends seven years underground as a "nymph" or larva before becoming adult. Cicadas vary greatly in size, and amongst the many species to be found throughout Australia are small insects measuring less than an inch across the expanded wings, to giants (the Double drummers, *Thopha* spp.) measuring just under six inches across the wings, and with bodies almost two inches in length and one inch in width. Tasmania and parts of alpine Victoria and southern New South Wales contain each a single species of "songless Cicada", (genus *Tettigareta*) really "living fossils"—examples of the types of Cicadas which had their hey-day thousands of years ago.

The Beetle exhibit was confined to the long horned beetles of the huge family *Cerambycidae*, or "Longicorns" as they are commonly called. Australia is rich in species, and these range in size from slender insects less than half an inch in length, to specimens with bodies almost three inches in length and antennae eight inches or more in length. Most of the very large species are found in the more tropical parts of Australia, but even in Victoria we have several handsome species with bodies well over two inches in length and correspondingly long antennae. Many of these insects are destructive to growing or freshly felled trees. The female beetle lays her eggs on or in the bark or sapwood, and these hatch out into grubs which bore their way through the wood, often for great distances. Some species have a life cycle occupying one year; others may take several years to become adult.

Phasmids or "Stick Insects" were represented by one case, and these large creatures are always interesting because of their remarkable shape and protective colouration. Living as they do amongst the tops of trees they are not frequently seen, though often during rough weather specimens are shaken from the higher trees and fall to within easy reach of the collector. The eggs are large and hard and are usually dropped by the female on to the ground where in due course they hatch out into small wingless "nymphs". These commence feeding on foliage, and from time to time "moult", casting off their entire integument. Immediately after a moult they are soft for a period, and it is during this brief period that they actually grow. After the final moult the wings appear and the insect is adult.

Moths were exhibited by two cases, one of *Hepialidae* (Ghost Moths), and one of *Cossidae* (Cossid Moths). Many of these are large and attractive insects, and in the *Hepialidae* many species are remarkably coloured with shades of deep green, silver spots, and pinkish or yellowish colouration.

*Curator of Insects, National Museum.

Hepialid larvæ may be either borers of growing timber or soil dwellers where they feed on the fibrous roots of native trees and shrubs. The duration of their life history varies, some species having a twelve months life cycle, whilst others extend over a period of several years. The larvæ of several of the soil feeding species are often attacked by *Cordyceps* fungus (*Cordyceps gunnii*, etc.) which give rise to the so-called "Vegetable Caterpillars". The spores of the *Cordyceps* are shed on the ground and are ingested by the caterpillars. In due course the spores commence growing inside the caterpillar, the mycelium of the fungus permeating the entire tissues, changing them into a fairly hard cheese-like substance. From the anterior end of the caterpillar the fruiting body of the *Cordyceps* grows out, and continues growing until it reaches the surface and for about a couple of inches above, when the cylindrical spore-head forms and produces more spores. The original shape of the caterpillar is retained, and from this the name "Vegetable Caterpillar" has been derived.

A case of Life Histories of Moths and some of their parasitic enemies was exhibited. In most instances the complete life cycle of the moth was shown, egg, larva, pupa and cocoon, and perfect insect. The parasites, which consisted of parasitic wasps and flies, are factors which maintain the balance of Nature and thus prevent particular insects from becoming over abundant. The wasps shown were *Ichneumonidae*, and the Flies, *Tachinidae*. In each case the larva is the host for the parasite which lays its egg on or just under the skin of the caterpillar. This hatches into a wasp or fly larva as the case may be which feeds on the interior tissues of the host. When fully grown the wasp larva usually pupates within the skin of its host, but if a fly parasite the full grown larva (maggot) leaves its host and drops to the ground where it pupates.

Six cases of Butterflies completed the exhibit. One of these contained Giant Bird-wing butterflies from northern Australia. Sexual dimorphism is very marked in these, the males being metallic green and velvety black with bright yellow bodies, and the larger females being black and creamy white and grey. In Australia, from the Clarence River, N.S.W., northwards to Cape York and several of the Torres Straits Islands, no less than four races occur of *Papilio priamus*—the Bird-wing butterfly. The genus *Papilio* which embraces all the Swallow-tail and Bird-wing butterflies, was represented by another case depicting the Orchard Swallow-tail, *Papilio oregonus* Don. This large and pretty species ranges from Victoria (where it is only rarely seen) to North Queensland. Females are a little larger than males and are quite differently marked. The latter are black with large cream markings, whilst the females are blackish brown with white markings and, on the hindwing, lunulated markings of reddish brown and blue. The larvæ feed on various kinds of Citrus trees, and in some parts of New South Wales and Queensland are minor pests of them. The family *Pieridae* (Whites) showed some species of the genus *Delias* which is remarkable in that all the species have their gayest markings on the underside of the wings. Sexual dimorphism exists and is fairly marked, males are black and white on the upperside whilst females are greyish white or yellowish white and black. The colouration of both sexes on the underside is similar and is black and white with orange and crimson markings on the hindwings. The larvæ feed on various species of Mistletoe. A case of one species of Nymphalid butterfly (*Hypolimnus bolina verina* Fab.) was displayed to show the difference between the sexes and the great range of colour variation exhibited in the female. These insects are large, black, with iridescent purple and whitish markings. The species ranges from Sydney to northern Australia. Another case showed some of the smaller butterflies of the Family *Lycaenidae*. These are brightly coloured insects which are black with metallic blue or purple markings, often with whitish areas in the wings. There are about 90 species of *Lycaenidae* in Australia, and the life histories

of many species are of great interest because the larvae live in association with ants which constantly attend them because of a sweet substance which they exude from special glands at the posterior end of the body. Lastly, a case of mixed butterflies completed the exhibit. This was to give representatives of all the families in Australia mainly for purposes of comparison for the benefit of persons who might be interested.

Though only a comparatively small section of the field of invertebrate zoology comes within the scope of the Entomology Department at the Museum, the range of the work is nevertheless quite comprehensive.

We are fast reaching the stage whereby a Museum is being recognized in the community as a centre of learning, which it rightly should be, and it is pleasing especially to Museum workers to realize that the old idea of its being a repository for old bones, skeletons, and a few stuffed birds and animals, is fast dying out.

The total number of insect and spider specimens in the National Museum collection would not be far short of a million; perhaps included in this vast number could be the Crustacea which come under the control of the staff of the Entomology Department also. The primary duty is the care and maintenance of the collections, many of which are of great value because of the great number of TYPES they contain. Other collections are important historically, and of this type perhaps the two most outstanding examples are the Curtis collection of British insects which is over 150 years old, and the famous Castelnau collection of Coleoptera.

It is indeed a task each year to go carefully through all the cabinet drawers and storerooms to ensure that none of the specimens is being attacked by museum beetles (*Anthrenus*) or Mites (*Psocids*). To guard against these troubles the receptacles for insecticide are kept full of a mixture of Naphthalene and Paradichlorobenzene. Specimens must be watched for other troubles such as mould, grease, or pin corrosion, and if any of these is noted it must be dealt with at once.

New specimens are continually coming into the museum; these have to be acknowledged in the appropriate way, labelled, and carefully set in readiness for housing in the reference or duplicate collections as the case may be. Sometimes specimens are received by way of purchase or exchange, or by direct gift, donation, or bequest.

Keeping up with the nomenclature relating to the various groups of insects is important because names are continually being changed. For this work it is necessary to have a good reference library at hand and to receive issues of all the leading journals dealing with both systematic and economic entomology.

Material is continually being sent in from various sources for identification; much comes to the museum through the post, whilst many persons bring their queries to us in person. Visiting scientists, who are specialists in various groups, from time to time spend a few days or even a week going through the museum material of the group or groups in which they are particularly interested. This is often the means of enabling us to bring the classification of a special group right up to date.

Field work is another phase of the work, and during the year members of the staff spend anything up to a fortnight in the field collecting specimens, data, etc. Upon return this material has to be labelled and set. Research work is still another activity, and, as time from routine and other duties permits, is undertaken by members of the staff in the particular groups in which they are interested.

The work is indeed varied, and brings museum workers into personal touch with people in many walks of life, and into correspondence with overseas workers and specialists, all of whom are members of a fraternity which holds a common interest, the study of a branch of one of the natural sciences.

EDUCATION AND ANTHROPOLOGY

[A Commentary on the Anthropology Exhibit at the Australian Nature Show]

By DONALD J. TUGGAY

If anthropology is the study of man in its widest sense, then everyone is an anthropologist in some degree, because everyone must adjust himself to the demands of his own culture in the process of socialization which transforms the narcissistic and animal-like demands of the infant into the maturer interpersonal adjustment of the adult. Yet every culture tends to be self-sufficient and its well adjusted human products have no doubt that theirs is the proper, the best way to behave. Our Australian culture shares this tendency and our educational system provides one of the main media for its perpetuation. We need, of course, the stability which well socialized individuals give any culture, but expanding communications, dwindling distances and the political events of our era have made the understanding of the way of life of other peoples vital to stable living in the same world. The Anthropology exhibit at the Australian Nature Show was a contribution towards such understanding.

The exhibit was organized by the Anthropological Society of Victoria and the National Museum of Victoria and occupied a floor space of only 22 feet by 12 feet. The materials were laid out on flat trestles and boards in the form of a hollow rectangle broken at two points to allow entrance and exit to the hollow of the rectangle, where a chair was placed for an attendant. Three quarters of the exhibit space was devoted to the Australian Aborigines, one quarter to peoples of New Guinea. Perhaps this proportion should have been reversed, perhaps it was a function of the material available or our own interest or public demand. It is difficult to judge. At any rate, one might say, that if understanding starts at home, the proportion was a good one. For the Australian Aborigines an attempt was made to demonstrate most aspects of life and to make these obvious from a study of the exhibit itself. Stone artefacts, as the primary tools of the culture, were, therefore, well represented by basic types from different areas. This led naturally to the manufacture of wooden artefacts, among them a spearthrower and a wooden bowl. Magic and ceremonial life was dealt with by demonstrating hull-carvers, churingas, Kakadu totem figures from the Northern Territory, cylcons, kurdaitcha shoes, pointing bones, widows' caps, gravemarkers, and feather decorations. There were also sections on fire-making, fishing, collected foods, and finally, a series of articles made under culture contact conditions. The Australian Aboriginal material was provided by members of the Anthropological Society, notably Dr. R. Wishart, Mr. S. R. Mitchell and Mr. R. C. Seeger.

The small section on peoples of New Guinea showed amongst other things, a homicidal head-dress, skirt, comb, bow and arrows, clubs, pottery, stone adzes and other material culture objects from the National Museum of Victoria. Both exhibits were completely labelled and illustrated by photographs mounted on a board 1 foot high, running around the back of each table. Throughout the Show, the exhibit was manned by at least one member of the Anthropological Society of Victoria who directed interest, answered questions and generally filled in the story of which the material objects formed the basis. Particular mention must be made of the work of Mr. E. W. P. Chinnery, former Government Anthropologist in New Guinea, who during the day gave the New Guinea material a living context for the hundreds of children and adults who were stimulated into asking questions. The amazing interest in this material was one of the features of the exhibit.

*Curator of Anthropology, National Museum of Victoria; President, Anthropological Society of Victoria.

The lessons learnt from the exhibition are valuable ones. The planning was done by a sub-committee of the Anthropological Society of Victoria.[†] The material was brought to the hall and laid out the night before the Show opened. Most of the labelling was done beforehand. This was found to be most desirable. Once the exhibit was up, the pressure of enquiry proved too much for would be labellers. The manning of the exhibit by a knowledgeable person contributed greatly to its educational efficacy, and the members of the Anthropological Society who undertook this tiring but worthwhile task are to be congratulated and thanked. The visitor who is met by a puzzle becomes frustrated and moves elsewhere, one whose curiosity is satisfied wants to learn more. The background photographs gave the exhibit a living context. These were the good points. On the other hand it was found that the trestles and boards were insufficiently stable to withstand the concerted pressure of a class of school children, the paper covers on the tables took on an air of dishabille towards evening and the exposed labels needed to be very well fixed. Material not under glass required constant surveillance to avoid over boisterous handling. This is a difficult question. First class material cannot be exposed to the wear and tear of being picked up, and yet the handling of material is so much better than mere seeing as an educational aid. The visible satisfaction of a boy who can feel a bow in his hand or beat a drum is very tangible evidence of the identification which can come with activity. If we knew the techniques, and had the person to run a play group on a day in the life of a New Guinea tribe, real cross cultural education would begin. But these things are for the future, for future Shows, future school curricula and future museums. Overwhelmingly, Australian children convey the impression of interest in life and what people do, we have only to supply the materials and techniques for study, not the motivation in the children themselves. Some are serious and bring their notebooks, others are pert and ask questions, but all display a capacity for identification and understanding of the problems of people in other cultures which makes one wonder what happens to the adults. Perhaps we need to examine our school curricula particularly in the later grades in Social Studies, and see where they can be oriented to fit modern Australian needs. First, in respect of content, to include study of our South-east Asian neighbours and our responsibilities in the Mandated Territory of New Guinea, and second, in relation to methods to include much greater use of exhibition and museum facilities.

In this reorientation of interest towards cultures which will play a large part in Australia's future, the Anthropological Society, the National Museum and public exhibitions have an important part. Exhibitions bring material to museumless suburbs and encourage the habit of exhibition visiting. The Anthropological Society provides a forum and meeting ground for interested members of the public and professional anthropologists. The Museum supplies the materials, better permanent exhibition facilities, loan teaching collections and technical knowledge. There is a great willingness to learn about others, and parochialism and self sufficiency are on the retreat. Anthropology, and the spread of knowledge about it, are potent factors in exposing the fallacy of racial emotionalism—adequate teaching aids are another. We need to think hard about the presentation of material culture and the role of the exhibit. Exhibition for exhibition's sake is a poor form of action. There is so much information and so much understanding to be given and, in giving it adequately and well, we are securing an understanding of social processes in our own and other cultures which will safeguard our future good relations.

[†]The Anthropological Society of Victoria was formed in 1934 to promote the study of anthropology and in particular that of the Australian Aborigines and native peoples of the Pacific area. Meetings are held every second Wednesday in the month from February to November at 8 p.m. in the B.M.A. Hall, Albert Street, East Melbourne.

INSECT PESTS, EXHIBIT BY THE MICROSCOPICAL SOCIETY OF VICTORIA

By F. E. J. OCKENDEN, F.INST.P., F.R.M.S.*

Unlike many of the works of nature, but few denizens of the insect world can be regarded as "friends of man". Some, for example locusts, compete vigorously with him for his limited supply of food plants, and others, a vast majority, acting as carriers of disease, either specifically as with certain mosquitoes, lice and fleas, or adventitiously as with house flies and other garbage feeders, are a menace to both his own health and that of the stock on which he depends for meat and transport.

Recognition and control of such important factors in human existence have been greatly facilitated by the use of the microscope and its associated research techniques.

Not only do these enable small differences in species, etc., to be readily determined, but by facilitating study, under varying conditions of the life history of an insect, together with its susceptibility to attack from yet smaller organisms, i.e. fungi, bacteria, viruses, etc., man is assisted to some degree, to suppress a menace which would otherwise if left to itself, rapidly "eat him off the face of the earth."

Some modern aspects of microscopical development have now advanced to such a stage as to be beyond the resources of the amateur. An outstanding example is the extremely recent Electron Microscope. With this instrument, magnifications of up to 200,000 diameters can be reached. It has, however, the disadvantage that all material has to be examined whilst in a very high vacuum, this obviously completely precludes the examination of living material.

Even in the case of non living specimens it is by no means certain that the stream of electrons with which they are bombarded during inspection is without effect on their composition and more delicate cytological and histological features.

Another recent development, "phase contrast" microscopy has the limitation that its use is restricted to the examination of very thin and transparent material.

Thus, where the study of the insect world is concerned, whether for research purposes or for the pleasure resulting from first hand knowledge of the "wonders of Nature" which can be obtained in this way, the ordinary optical microscope still remains the instrument "par excellence" for the purpose.

It is interesting to note that many of the most profound studies of insect life have been made by amateurs working solely for the love of it. The works of le Fabre and the famous monograph on the house fly by Lowndes, are outstanding examples. Even to-day there remains a wide field for exploration in which the amateur Microscopist can find a lifetime's interest.

A full study of insect life can involve not only the dissection and delineation of insect anatomy, but investigation into the function of features the use of which is at present completely unknown.

The amazing development in the insect world of "inherited behaviour" by means of which, for example, the leaf cutter bee will, without tuition, cut accurate circles from a leaf and use them to build a nest, or a spider, though not strictly an insect, will spin its web without any previous experience or instruction whatever, is an outstanding source of wonder to the student of natural history.

*Mr. Ockenden is the Immediate Past President of the Microscopical Society of Victoria, which meets normally in the Royal Society's Hall once each month and whose *Proceedings* appear twice a year. The Honorary Secretary of the Society is Mr. W. I. J. Evans, 9 Peter Street, Footscray.

Much remains to be discovered in this sphere alone. By what "clock" for instance, does the cicada measure the seven years it remains buried underground before emerging to take up its ephemeral existence as a complete insect?

Life histories, habitats, food plants and modes of multiplication all present problems which only patience and the use of the microscope can solve. These studies lead naturally to work on plant and aquatic life with their profound influence on every aspect of human life and health.

The world of beauty and interest made available by the microscope is of unlimited extent and provides a hobby offering, in addition, a degree of intellectual satisfaction which it would be difficult to surpass.

ROYAL AUSTRALASIAN ORNITHOLOGISTS UNION

By E. S. HANKS

A mounted specimen of a large Wedge-tailed Eagle with outspread wings surmounted the exhibit of the Royal Australasian Ornithologists' Union. Around the walls were arranged a number of paintings and drawings, the work of several of its members. On the table were shown samples from the excellent library available to members. Next to these were periodicals about birds, publications coming from all over the world. A showcard announced that these and many more may be had for study. The aims and objects of the organization were outlined and an invitation given for those interested to become members.

The nests of about twenty species of birds were shown, the selection being mainly from those to be found near Melbourne.

The Royal Australasian Ornithologists' Union was formed in 1901 to organize the activities of ornithologists throughout Australia and New Zealand. It embraces both the scientific and the popular sides of the subject. Conservation is an important part of its work, a committee being constantly engaged in securing the protection of species in danger of extermination. A highlight in the activities of the Union is the Annual Congress, held in a different state each year and followed by a Camp-out in a selected area of that state. This provides excellent opportunities for observing birds in the wild.

The quarterly journal, *The Linn*, is equal in quality and appearance to any other published in any part of the world. It circulates in scientific societies in every continent.

The Honorary General Secretary of the Union is Mr Gordon Rims, 386 Flinders Lane, Melbourne.

THE GOULD LEAGUE OF BIRD LOVERS OF VICTORIA

By H. E. STEPHENSON²

Early Australian history presents a sorry picture in regard to treatment of native fauna, and any protective measures during the nineteenth century were the results of influence by a few bird and animal lovers. But legislative measures are not the only means nor the best—in achieving preservation, and in 1909 steps were taken in our state to demonstrate this.

With the formation of the Gould League of Bird Lovers of Victoria, education became the principle method of attaining the desired effect. With the Hon Alfred Deakin, Prime Minister of the Commonwealth as president and Mr. J. A. Leach as honorary secretary, the movement was acclaimed and supported throughout the schools of Victoria, and in the first year 25,000 members were enrolled. Life membership was granted for a fee of

²Secretary and Organizer, Gould League of Bird Lovers, State School No. 1886, Abbotsford. (Telephone: JA 4011).

one penny, which has since been raised to threepence for children and one shilling for adults.

Since the inauguration of the League, membership increased to 316,712 to the end of 1952. The annual magazine, *The Bird Lover*, was first issued in 1948, and in that and successive years, an annual sale of over 30,000 copies has been maintained.

The Gould League welcomes the opportunity to arrange displays of competition work and to enrol new members. At the October Nature Show, children from schools out of contact with the League showed considerable interest in the exhibits, and large numbers became members. The worth of the display cannot be set down wholly in figures, but it is interesting to report that 628 new members were enrolled, and 72 hedges, 86 sketch books, and 393 copies of *The Bird Lover* were sold.

BIRD OBSERVERS CLUB AND ALTONA SURVEY GROUP

By ROY WHEELER*

The Bird Observers Club display consisted of one stand of bird photographs taken by members of the Club—Messrs Harvey Dickson, Ron Ferguson, Bryan Mitchell, A. D. Selby and H. E. Tarr. The other stand displayed Club publications, *The Hawk Booklet* and *The Wader Booklet*, as well as copies of *The Bird Observer*, excursion list, etc.

The Bird Observers Club was founded in Melbourne in 1905, and its numbers were limited to 25 male members of the R.A.O.C. In 1912 the number was increased, but it was not until 1927 that female members were admitted. At present the B.O.C. has an Australia-wide membership of over 300. Its aims are the conservation and preservation of our native birds and to help and encourage members in the study of our bird life. The B.O.C. holds monthly general meetings in the Theatre at the Museum. Talks, together with films or slides of bird life or other natural history subjects are the feature of each meeting which is usually in the hands of a well-known ornithologist. From May until October, study Meetings are held each month in the bird room of the Museum, where the lecturer has skins from the famous H. L. White collection for demonstration purposes. During each month, a Club outing to some favoured bird spot near Melbourne is made by parlour coach, and special holiday trips are made at Christmas, Easter, and the June week-end. Many members are actively engaged in outings with the Altona Survey Group and the Helmeted Honeyeater Survey. The Club publishes a monthly paper *The Bird Observer*, with popular notes, articles, lists and the activities of the Club. Twice a year supplements are published, one of a bird list from a certain area, and the other World Bird Day lists from all over Australia—these lists are made during the last days of August each year.

The badge of the Bird Observers Club is the Blue Wren. The Honorary Secretary is Mr. Bryan Mitchell, 4 Victor Avenue, Cheltenham, S.22.

The Altona Survey Group was instituted in June, 1950, by a number of enthusiasts consisting mainly of members of the Bird Observers Club and the R.A.O.U. The objects of the group were to study the bird life on the Salt Works area near Altona and make a census of the district, and at the same time, study the life history of the Silver Gull which nests there in several colonies. Since the start, over 150 persons have taken part in the weekly surveys, visitors from all Australian States, New Zealand and overseas also assisting. This group is the only one actively engaged in ringing birds, outside of interested Government departments, and young Silver Gulls are ringed there each nesting period. Recoveries have come from as far afield as Sydney and Hobart. A "hide" overlooking one of the nesting

*President, Bird Observers Club; Organizer, Altona Survey Group.

colonies is used extensively for recording display, nesting behaviour, habits, feeding, etc., of the breeding birds. A 24-hour watch was made from the hide in September 1951, an interesting and unique observation. In April 1952 and 1953, members completed a census of the gull population of Port Phillip Bay and adjoining areas with most interesting results. The group is in need of transport and field workers during the spring and summer months. If you feel like assisting us, please contact Miss Ina Watson, at FA 8555 (business hours).

"Members of this group walked over 4,000 miles in three years in making a Bird Census of the Altona marshes. They counted over 600,000 birds of 171 species, and also ringed over 300 Silver Gulls". This was the heading on the display-board of the Altona Survey Group at the Nature Show, and flanking it on either side was the bird list of the 171 species recorded on this census. Beneath the heading was a map of New South Wales, Victoria and Tasmania, with coloured ribbons leading out from various points on the map to reports on ringed gulls sent in from these places. Some of the reports displayed the actual ring recovered from the bird. A specimen Silver Gull was on display with rings as attached by group members. Various types of bird rings were on show, as well as charts and reports of the many activities of the Altona Survey Group.

FIELD NATURALISTS CLUB EXHIBITS AT THE NATURE SHOW

SNAKES

By IAN WALLACE

The keen interest shown in the snakes proved just how eager youngsters are to learn something of the creatures people normally loathe. At the same time it stresses the need for children to be educated in that direction so that they may have more knowledge but less fear of reptiles than do many of their parents. It is surprising just how little the average person knows of snakes, and it is only by the children being taught more of natural history, that we shall have a generation that understands these simple things.

The snakes exhibited were Tiger Snakes *Notophis scutatus*, Copperheads *Dousonia superba* and White-lipped Snake *D. coronoides*.

The Tiger Snakes were of different sizes and various colours so common in that species, the smallest being one of last year's young—hardly six inches in length and prettily marked with vivid orange and yellow cross bands, and it was greatly admired by the children. The small amount of venom yielded by a Tiger Snake at a single "milking" (about 2 drops) surprised many people who had imagined a much larger quantity would be necessary to kill a human. Few people realize that Tiger Snake venom ranks as one of the most potent snake venoms in the world.

Great interest was shown in the White-lipped snake, possibly because they are less common than their larger cousins, when fully grown measuring only about eighteen inches in length. They are very pretty little snakes and have a conspicuously white upper lip. They would make splendid pets and can be handled without fear of unpleasant circumstances, for they are inoffensive and harmless. Although they possess venom, it is of no danger to humans.

The Copperheads drew the least attention, possibly because they do not possess vivid colours like those of the Tiger Snakes. Many people asked how the name "Copperhead" originated. It was apparently derived from the young of the species which as a rule have the truly copper-coloured head, a feature usually absent in the adult.

As very little work has been done on Victorian snakes, there remains a vast field to be explored by those interested. The few hazards involved in the study of dangerous snakes have been almost eliminated by the introduction of a most efficient antivenine. With this readily available and with a thorough knowledge of the appropriate first aid, one should have no undue worries.

GEOLOGY

By A. A. BARRE

How old is Australia? Is Australia the oldest country in the world? These and similar questions, based mainly on thoughts of our primitive aborigines and mammals, are questions that are frequently asked. This suggested the geological exhibit at the Prahran City Hall.

Twelve charts, each with a brief description of conditions occurring at a period of the earth's history, together with specimens to illustrate, conveyed the thoughts of the visitor from the Pre-Cambrian (550-1,000 million years ago) to the present day.

At the end of the exhibit, a folder contained the answer to "How Old is Australia?"

To outline this history would require more space than is available in the present journal, but this will be dealt with at a later occasion.

Questions relating to the geological history of Australia and the rest of the world are being discussed at monthly meetings of the Geological Discussion Group of the F.N.C.V., held in the National Museum, Russell Street, Melbourne, at 8 p.m. on the first Tuesday of each month. The next meeting will be on February 2, 1954, the subject—"Geological Holidays".

Commenced over seven years ago, this Discussion Group offers an excellent opportunity for Club members to gain up to date knowledge of that interesting and important study of the earth's crust. If you are interested, why not contact the Secretary for further particulars? The necessary information is found on the inside back cover of the *Naturalist*.

CONCHOLOGY

By E. MACFIE

In the Conchology section the writer's exhibits were staged with a view to the interest and instruction of the young folk who attended the Exhibition in such numbers.

There was a small collection of common Victorian shells, that anyone interested might hope to find without difficulty on our beaches, both bayside and ocean.

Another section showed shells easily collected on the various islands of the Barrier Reef by any visitor there. These were mainly the smaller types of shells, both univalves and bivalves. Varieties of Cowries and also of Cones, collected around the Pacific Isles, were included, showing some of the poisonous members of the latter group.

Of particular interest were some large and very beautiful shells mostly univalves—varieties of *Harpa*, *Sonna*, *Murex*, etc., which were collected around the Pacific Ocean more than a hundred years ago. The collector was a ship's commandant who was decorated for the part he played on the siege of Acre in 1840.

[The major portion of the Conchology section was exhibited by the veteran F.N.C.V. authority on this subject, Mr. C. J. Gabriel, who is now convalescing after a sojourn in hospital. Among his exhibits were examples of the Pearly (Chambered) Nautilus and the Paper Nautilus, drawing attention to the differences in the make-up and function of each—the latter being really the egg-case of its species. A series of Victorian Cowries graded from the tiny immature shells to the perfect adult specimens with inturned lip calloused and toothed. There were beautiful and gaily-coloured *Spondylus*, Spiny Oysters, great tropical land shells and a host of other material. An example was displayed of the tiniest Victorian shell, a perfect coil but needing magnification to be recognized at all—one youthful visitor asked of its collector, "How did he know what it was, and how did he know when he'd found it?"]

WILD FLOWERS FROM THE GARDEN

By A. J. SWADY

Many members were surprised to find no flowers in the Show from the bush. Looking back, we can scarcely regard the classification sections of recent years as satisfactory—too many flowers plucked, too few qualified systematists, hasty rearrangement for parcels arriving late. The outcome was not spectacular, there were few visitors interested in mere names and the great majority passed by with hardly a glance.

We should have our local flowers represented; but in a way which would stimulate observation. Doubtless, those preparing for the next exhibition would welcome suggestions. One thing is certain—we cannot return to indiscriminate gathering of all in sight.

The date was rather late for the spring flush; nevertheless a very attractive display was made of cultivated specimens.



A Corner of the Australian Flower Section at the Show

Mr. Morris arranged a very beautiful stand from Melbourne Botanic Gardens and Metropolitan Golf Club. Some showy buds of *Eucalyptus Ichmannii* were noted. *Boronia heterophylla* and *B. denticulata* were particularly well grown.

Frankston Golf Club had some outstanding specimens. *Anigozanthos manglesii*, *Dryandra formosa*, *Leschenaultia biloba*, *Banksia coccinea*, *Hakea victoriae*, (so named; although known to most of us as *H. cucullata*), and *Eucalyptus preissiana* are evidently quite at home in the coastal sands.

North Queensland Naturalists put in several orchids. The lush foliage of their trees contrasted strongly with specimens from other parts.

South Australian Naturalists showed, among many other good blooms, excellent clusters of *Clanthus dampieri*.

Telopia speciosissima and *Grevillea sericea* were notable amongst flowers from New South Wales. Western Australia produced *Darceinia citriodora* with heads thrice as large as we can grow. *Pimelea spectabilis* received a good deal of attention. The most interesting, however were several species

of *Stylidium* (Trigger Plant). They should have had more prominence. Miss Ashby, of the Adelaide Hills, combined with Broken Hill Naturalists in a dainty table.

As always, Mr. Ivo Hammet produced some lovely specimens. How could he spare those five-foot branches of *Grevillea macrostylis*? *Melaleuca trichophylla* was a gem from fairyland. *Epacris longiflora* made another spectacular bunch. There were only two spikes of *Melaleuca fulgens*; but their brilliant red caught the eye at once.

Perhaps the best from Maranoa Gardens were *Calytrix*, *C. tetragona* and *C. sullislandii*. *Anopterus glandulosa* was also admired.

This stand had short notes on stature and conditions of soil and moisture. It was very evident from the notebooks produced that the small extra trouble was well worth while.

In thinking back over the display and the comments of patrons, one can see that the popularity of Australian plants amongst home gardeners is very definitely growing, and they are looking for help.

There should be a small sub-committee for this section of future shows, to plan the general organization and arrangement, secure the co-operation of other States, and prepare notes on suitable species and their treatment. Exhibits should have bold labels, and at all times there should be in attendance at least two persons with knowledge of the cultivation of our Australian flora.

MARINE LIFE

By M. E. FREAME

Visitors to the Nature Shows of the F.N.C.V. are always interested in the marine specimens. The small boys wonder how the whale manages to obtain enough food through the fringe of the balcon, and toothache is often mentioned when they see the large teeth of the killer-whale. They have lots to say about the barnacles that attach themselves to the whale, and the plankton upon which it lives.

Attention is attracted too by the poisonous fishes. Amongst them are the Queensland Stone Fish with its deadly spines, the Tody and Porcupine Fish that blow up like a balloon and float, and the Cobble, a prick from which can be very painful.

The Sucker Fish attaches itself to various denizens of the deep and is thus borne along.

Leafy Sea-Dragon, Sea Horse and Pipe Fish are interesting because the males carry the eggs until the young are hatched—in a more comfortable manner than does the small Soldier Fish which carries the eggs in its mouth for about two weeks.

A specimen which causes considerable interest is the Angler Fish, which dangles a small "line" and "bait" just over its mouth.

Among the crabs are those that grow gardens of seaweed over themselves; others carry sponges on their backs. The Rashid Crab folds its front claws as though to hide its head; and the Swimming Crab has swimming paddles as its hind legs. Few have seen the King Crab from New Guinea.

The most admired specimens are the beautiful sponges, *Euplectella*, and starfish, *Astropecten*, the latter from deep water at Portland Bay.

Among the Corals, the Sea Pen was one of the wonders of the sea-life; and there were the Jelly Fish and Portuguese Man-of-War. The remarkable *Volvox* divides among its members the different functions of the colony: special nutritive polyps undertake the nutrition, bell-shaped individuals, like medusae perform the swimming movements, and true medusae are charged with the reproduction.

PRAHRAN JUNIOR NATURALISTS CLUB

On Tuesday, November 17, a preliminary meeting was held at the Prahran Children's Library, to test interest in the formation of a Junior Naturalists Club for that area. About 40 children and several adults were present, and the purpose of the proposed club was outlined to them.

Our President, Mr. A. A. Baker, spoke of experience gained with the Hawthorn Junior Club, and showed those present a series of geological specimens. Other exhibits included Barrier Reef shells and nature photographs from Mr. F. Lewis, and a representative series of useful natural history publications.

As it was apparent that live interest was there, the F.N.C.V. Council appointed a sub-committee comprising the President, Secretary and Editor, who conferred further on the subject with Miss E. Haynes, who has charge of the Prahran municipal libraries.

It was decided to invite membership from both children and adults, at a subscription fee of 2/6 per annum. The Club is to have a President, Secretary, Treasurer and Excursions Secretary who, with three other people, will form a committee of seven to organize and conduct activities.

Meetings will be held at 7.30 p.m. on the third Tuesday of each month (excluding January) and are to be conducted on the lines of those of the senior Club. At the next meeting, on December 15, Miss Ina Watson will give an illustrated talk on Central Australia. Senior Club members are invited to attend and lend support to the new body.

It is the opinion of the F.N.C.V. Council that a strong working Committee will need to be formed in the senior Club, to direct or actively support this and other youth activities. The matter will be put before the Club at the December General Meeting.

—N. A. WAKEFIELD.

NATURE NOTES AND EXHIBITS

Entomology

A new species of Swift Moth (*Hepialidae*), from Ridgeway and Lenah Valley, Southern Tasmania; of which a preliminary description is given:

OENETES TAGGI, sp. nov. Male: Length $1\frac{1}{2}$ inches; width across wings 2 inches. Head, thorax and forewings brown suffused or overshot with green; on wings there are some obscure reddish spots, near hind margin and towards termen. Hind wings with apical part dark fuscous brown and the basal half flamingo. Female: Larger, pale green with pink markings.

—CHARLES G. OKE

WHAT, WHERE AND WHEN

Excursions:

Sunday, December 20—Botany Group Picnic at Fairy Dell. Take either 8.48 a.m. or 8.55 a.m. train to upper Ferntree Gully, then Monbulk bus to terminus. Bring two meals.

Preliminary Notice:

Monday, January 25—Australia Day—Parlor coach excursion to Lorne. Coach leaves Batman Avenue 8.15 a.m., returns 8.15 p.m. Fares 18/-, bookings with K. Atkins, Botanic Gardens, South Yarra, S.E.1.

[No Geology Group Meeting will be held in January.]

KENNETH W. ATKINS, Excursion Secretary

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PROCEEDINGS

At the General Meeting of the Club at the National Herbarium on December 14. Mr. Baker presided and about 180 members and friends were present. Messrs. Pearson, Mules and Oke were elected as Ordinary Members, Mr. and Mrs. Coghill as Joint Members, Mr. Austin as Country Member, and Misses Yuer and Lemak as Junior Members. Mr. Baker expressed gratification that so many Junior Members were being enrolled and that more persons with entomological interests were joining the Club.

Our veteran member, Mr. George Coghill, presented the Club with a book picturing some scores of lovely plates of our eucalypts. When thanking him, Mr. Baker informed the gathering that the Club Library was now in the new room at the Royal Society's Hall, and, pending the necessary sorting out, would be in normal use again early in the new year.

Nominations were called for the reforming of the Youth Movements Committee for the purpose of attending to questions of Junior Clubs and school nature study. It is desired to have the names by the January General Meeting, so that the Council can finalize the matter at its next meeting later in that month.

A report was given from the Wattle Park Committee of the successful planting of native trees and shrubs in that park. It was remarked that the growing activity of the Club in establishing Australian material in parks and enclosures was winning the F.N.C.V. recognition as an authoritative body on that subject. Deep concern was expressed at a proposal by the Tramways Board to remove a large number of trees at the Park for the establishment of further golfing facilities in the locality. Mr. N. K. Miller and Mr. V. H. Miller moved that a letter be written to the Camberwell and Box Hill Councils, the Commissioner of the M.M.T.B. and the Minister for Transport, uncompromisingly opposing the extension of the golf course. This was carried unanimously.

As Mr. Lewis was unable to screen his North Queensland films owing to a recent injury, Mr. J. H. Willis treated the meeting to an excellent impromptu talk on the Hammersley Ranges. This mountain chain, situated in the north-west of Western Australia, is 100 miles long and rises to an elevation of 4,000 feet. It is a residual plateau through which the tributaries of the Fortescue River form a network of precipitous gorges, in the depths of which persist pockets of rain-forest vegetation allied to that of New Guinea and Timor. John Forrest traversed the area in 1874 and amazed Baron

von Mueller with his botanical collection from there. However, it is an arid place, with a very erratic rainfall averaging only 8 inches a year. The deposits of asbestos there now supply 95 per cent of Australia's output of that commodity. Mr. Willis went on to show a series of Kodachrome slides, sent to him for a brief loan by a local correspondent at the asbestos works. These artistically depicted the brilliant colouring and spectacular nature of the towering crags with Ghost Guns perched precariously on rock ledges, the white-trunked variety of the river Red Guns by the cool blue rock-pools in the depths of the gorges, striking panoramic views of the intricate gorge pattern, the savannah forest and Porcupine Grass of the plateau top, and numerous other features of this extremely interesting region. When thanking Mr. Willis, Mr. Baker remarked that the rock formations were residual outcrops of extremely hard sandstone which had withstood the weathering effect of the hot and arid climate.

Mr. R. J. McMahon followed with a plea to the Club to join what he termed the "Battle of the Foreshore". He explained how various factors over recent years had resulted in an enormous influx of summer campers to the foreshores from Dromana to Sorrento. This is resulting in wholesale destruction of the normal tree and shrub vegetation, causing an extensive secondary growth of alien weeds and the problem of erosion. An outline was given of the political moves in connection with this camping question, and it was maintained that the foreshore should be carefully re-established and preserved, while the holiday-makers used less vital areas of land removed somewhat from the beach. Mr. McMahon suggested that members of the Club should visit Rosebud between Christmas and New Year to obtain a first-hand impression of the situation. Mr. Baker said that the Club was sympathetic to the problem, which should be considered in council.

The President then extended to members the season's greetings, and adjourned the meeting for the conversazione and examination of exhibits.

NATURE NOTES AND EXHIBITS

Botany—

Pittosporum bicolor—garden-grown flowering branches exhibited October 12, 1953, for T. S. Hart, Croydon, who writes:

"Seeds from the Dandenong Ranges were sown in November 1944. By memory, germination was slow. At 16 months some were still in pots and some planted out. A few flowers have been seen in earlier seasons but this year one tree about 13 feet high is flowering freely. The tree is straight-stemmed, upright and rather narrow pyramidal in shape, perhaps due to being somewhat well sheltered when young."

Ornithology—

Nests of the Helmeted Honeyeater, *Meliphaga cassidix*, one of the world's rare birds. This exhibit has more than usual interest for the Club, as on the very day 69 years ago, November 9, 1884, the first nest and eggs of this bird

known to ornithology, were taken by the late A. J. Campbell on the Olinda Creek near Lilydale. The outing, also historic as the first "Camp-out" of the Field Naturalists' Club of Victoria, is described in an article in the *Victorian Naturalist*, Vol. 1.

The article gives a short list of the principle species identified during the outing; these include among others: Red-necked Wallaby, Koala, and two of birds which would now rarely if ever be seen in this area, the Spotted Quail-Thrush, and the Southern Stone Plover.

As it was the first "camp-out" of the Club, the names of those present were placed on record. These included that of Mr. George Coghill, who was present at the meeting on November 9, 1953, when this note was read.

—E. S. HANKS.

COMBINED EXCURSION TO MOUNT ELIZA

Forty-five excursionists, from the ranks of this Club and the Frankston F.N.C., combined for a visit to Mount Eliza on September 6. The F.N.C.V. members loitered somewhat on the half-mile walk to the rendezvous, for the bird-life by the wayside was too rich to be passed quickly. The attractive calls of the Golden Whistler contrasted with the raucous notes of the Red Wattle-Birds, Restless Flycatchers performed their well-known "scissors-grinding", acrobatic Grey Fantails flirted here and there, Yellow Robins twittered pleasantly, and ascending tree-trunks in search of insects were some White-throated Tree-Creepers. From afar came the rollicking notes of the Kookaburra, White-backed Magpies roved the fields, Blue Wrens and Brown Thornbills flitted amongst the roadside scrub, and the Black-faced Cuckoo-Shrike was in evidence. The piping notes of the White-naped Honeyeater were heard, there were groups of the coastal Yellow-winged Honeyeater, and in a spreading Ribbon Gum a pair of Striated Pardalotes showed themselves to the company.

Having finally joined up, the large aggregate party made its way through Silver-leaf Stringybark and Manna Gum towards Mount Eliza. The undergrowth was Cherry Ballart with the rich green foliage yellow-tipped, Swamp Paperbark in dense thickets, and in full bloom, the Coast and Hedge Wattles. All four orchid species seen were of the genus *Pterostylis*—Nodding Greenhood was most numerous, Trim Greenhood grew thickly in isolated patches, Maroon-hood displayed its dark flowers on stiffly erect stems, and the few Tall Greenhoods included one with a spike of sixteen flowers.

On the east side of the brow of Mount Eliza, there are several acres of White Sallee, the lowland form of the Snow Gum. The trees were felled some years ago, and coppice growth, now fifteen feet or so high, makes an attractive sight. The slender trunks, dull white and blotched with grey, contrast attractively with the bright red branches.

It is hoped that this pleasant outing will be the forerunner of further combined Club rambles on the Mornington Peninsula.

—K. W. ATKINS.

BIRD ANTING

One of the first naturalists to observe the habit of birds using formic acid was the American, Audubon. One day he saw several birds upon a deserted ants' nest. Over this they were walking, and at the same time appeared to be pushing their wings against the surface of the nest. After watching them for some time he came to the conclusion that they were striving to incorporate with their feathers some of the formic acid with which the ground was saturated. He expressed the opinion that this was to eliminate parasites.

—A. A. BRUNTON.

NATURE PHOTOGRAPHIC COMPETITION PRIZE-WINNERS



FIRST:

"Skua Gull and Chick"

—H. R. J. Dingle

The Nature Photographic Competition was conducted by the Victorian Association of Photographic Societies, in conjunction with the F.N.C.V. Australian Nature Show at Prahran in October 1953. A selection of the 83 entries was displayed on that occasion, and the three which were judged the best are reproduced here. A report of the competition appeared on page 147 of the *Naturalist* for last month.



— 1953 —

— 1953 —

— 1953 —



THIRD

"Eel Seals Fighting"

- F. Lewis

HABITS OF EAST GIPPSLAND CURRAWONGS

By W. HUNTER, Marlo

The heading "Birdland Airlift" in the *Naturalist* for August (p. 79), recalls an experience, also with a Pied Currawong ("Bell-maggie"), several years ago, in the forest country east of Cann River. Our camp was the site of a recent C.R.B. road construction camp, and rats were so troublesome that I soon had to set traps for them. After the first night's trapping, I placed the dead bodies of three rats on a large sawn-off stump in the clearing, where they could be easily seen by the currawongs that came each morning for scraps. Soon one bird appeared, alighted on the stump, and picked up one of the rats, holding it transversely in its beak. To my surprise, it then picked up another. Naturally it had some difficulty in doing so, and more difficulty in getting both rats balanced for holding, several re-shufflings of position being necessary before the bird appeared to be satisfied. It then completely amazed me by attempting the obviously

impossible feat of picking up the third rat. The attempt caused it to lose its hold of the other two; so it had to begin all over again. And again, after the same difficulty in slowing two rats, it nullified its work by trying to take the other also. After spending some minutes in repeated unsuccessful attempts to get all three rats into its beak, it eventually flew off with two of them.

The stump was about three feet high and broad enough to give the bird a short run-off, but it sank almost to the ground with its load, and continued for several yards flying slowly and very unsteadily. However, it did not "crash", and was soon in better control of its flight and slowly gaining height, though it was still low when it disappeared into the forest.

Almost immediately afterwards, another currawong came along and took the remaining rat. I assumed that the first bird's desire to carry off all three rats at once was due to its knowledge of the nearness of the other bird, ready to take the leavings before it could return. But that idea seemed to be disproved when very soon the first bird returned and, alighting on the stump, began a thorough search, which I felt could have been only for the rat which it had left there. It continued its search of the ground around the stump for several minutes, and when it flew away it somehow suggested that it was puzzled and disappointed.

My opinion is that the obvious difficulty which the bird had in its flight with the two rats was due less to the weight than to the position of the load, which must have been unbalanced. Transfer of the load to its claws (as in the case reported by Miss Gailbraith) would restore the balance; but I cannot remember ever having seen such a manoeuvre, while admitting that my observation of birds has been rather casual. This bird certainly did not do so while in my sight; but that may have been because it was still too close to the ground, or because of the impossibility of taking the two rats again in its beak while in the air, before alighting. Perhaps the latter suggestion is a rather rash one in the circumstances; the feature which most impressed me was the bird's determined attempt to accomplish the impossible feat of holding three rats in its beak. Perhaps it had heard of how the pelican became famous, and was trying to emulate that bird!

One day more recently, in another camp, a sudden bird commotion drew my attention. Not far away, a freshly-killed rabbit had been prepared for cooking; and now a pied currawong was flying off with most of the innards grasped in its claws but hanging well down in an untidy mess and being torn by at least a dozen other currawongs, which were continually swooping in to take their share of the feast. The bird was handicapped by its load, and could do nothing to hold off its pursuers; it just kept its grip and flew on, squawking loudly, while the other birds made a great clamour, which we could hear for long after they had passed out of sight in the forest.

Currawongs are birds of the forest; but in autumn large numbers congregate about the settlements and remain there during the winter, dispersing to the deeper parts of the forest in early spring. During such seasonal visits, I have sometimes observed fraternization between the two species—the pied and the grey. In "the bush", the currawongs are usually scattered in small or family groups, and I have not observed any such fraternization there, even when the birds congregated in much larger groups. In Marlo, during the winters of 1951 and 1952, a flock of currawongs came fairly frequently every day for scraps. It varied considerably in number, from about 20 to occasionally over 50, the majority being the pied species, and about six of the grey. They fed together as amiably—or as unamiably—as if they were all of the same kind, and when the flock had its occasional sing-song all joined in the singing.

Rarely—I noticed about five or six such incidents—when several currawongs were on the ground and rushing for scraps of food thrown towards

them, a bird towards the rear would suddenly grip firmly in its beak the tail of another bird ahead of it and tug heartily, preventing further progress for a second or two. Was it a sort of practical joke? The "joker" was not always the same bird; once or twice it was a grey currawong, at other times it was a pied.

The grey currawongs, or some of them, in a little time showed less shyness of humans than did the others; and when the flock temporarily broke into small groups the greys remained together. While the pied currawongs took fruit almost as eagerly as they took meat, these greys showed no interest in fruit; otherwise the two species seem to have similar tastes and preferences in food.

I do not know whether the currawongs regularly visit the same spot for the winter; but this year there have been considerably fewer of them, and they have come around less frequently and in smaller groups, all of the pied species. I have occasionally seen in the vicinity a grey currawong, or less often two of them, but never mingling with the pied, as the greys had done during the two previous seasons.

The currawong is the largest of the birds of the East Gippsland bush which can be readily enticed about a camp by the offer of food. Its size gives it superiority over the others in enforcing an exclusive right to the feeding-ground; so that most of the smaller birds are very shy about taking offered food when a currawong is near, and usually restrict their appearances to times when there are none about, or they may, if many currawongs are more or less constantly present, avoid the place as a feeding-ground. I like to encourage all birds to come about my camp, but it is rather unusual to have two kinds feeding together, when they do so, one is noticeably watchful of the other, and there is a tenseness which is not evident when the birds are all of the same species. I used to try by scattering the larger scraps in one direction and smaller crumbs in another to encourage all the birds to come together, but I soon found that my scheme did not work out as I hoped; the larger birds showed just as much relish for the crumbs as for the bigger scraps.

The bird whose presence at meal-times seems to be most resented by the currawong is the Grey Thrush. As I have a special liking for thrushes, the currawongs have a low place in my order of preference for the birds. But to be fair one must admit that it is its size that makes it appear the offender. The intolerance of sharing a meal with other species seems to be fairly common among wild birds, and a thrush will chase away a yellow robin, for instance, just as aggressively as a currawong will chase away a thrush.

There has not been much variety in the kinds of food offered to the birds at my camps, but the currawongs ate and appeared to enjoy practically anything, including any paper well impregnated with fat or the like. They showed the greatest relish for meat, and cheese, cold porridge, and bread came probably in that order of preference. Like all wild birds, they have a wonderful instinct for recognizing at a glance whether anything thrown out is edible or inedible. Soap is perhaps the only thing which does occasionally mislead them, and until they have learned to recognize it a small cake of soap left uncovered is likely to be pecked badly, or to be carried away.

As I write this, I am reminded that the currawongs do not always fare the better in competition with smaller birds. Two currawongs, each in a separate brief encounter, have just been completely routed by a pair of red wattle-birds. The wattle-birds were certainly the aggressors. In a sudden concerted action they swooped on one currawong, which was quietly perched on a tree, and quickly put it to hurried flight, squawking vigorously. Returning from that chase, they almost immediately launched a similar attack on another equally inoffensive currawong in a near-by tree, and quickly put it to flight also.

SYSTEMATIC NOTES ON VICTORIAN MOSSES—3

By J. H. WILLIS, National Herbarium of Victoria

ACAULON and *POTTIA* (*Pottiaceae*)

(With a new combination and descriptions of two new varieties)

Species of the pottiaceous genera *Acaulon* and *Pottia* are among the smallest of Australian terrestrial Musci. Consequently they are often overlooked and seldom collected, and fortunately their nomenclature is relatively free of synonymy. The aim of the present paper is to list the entities known to occur in Victoria, with synonyms as far as these have been investigated (but only with reference to Australian material). I have examined the various collections cited under each species; they are believed to embrace practically all the material that has ever been collected in the State, and are located at the National Herbarium, South Yarra, Vic., either in the departmental folders or those of my own private moss herbarium.

ACAULON C.M. (syn. *Sphaerangium* Schimp.) is a small cosmopolitan genus consisting of minute gregarious rosette plants in which the broad erect leaves overlap closely, concealing the very shortly stalked, deperculate and non-apiculate capsule. In external appearance *Acaulon* is rather like *Gigasprium* (often co-extensive on open ground), but that remarkable genus differs in its subterranean "rhizome", nerveless leaves, larger hemispherical capsules (to 1 mm.), deciduous operculum and much larger, irregularly polyhedral spores (90-130 mic. wide). Only one rather variable species would seem to be represented in Victoria (around and west of Melbourne): it is *A. apiculatum* (Hk.f. & W.) Jaeg. under which I shall describe a hitherto unrecognized variety from the extreme north-west of the State. Individuals of *A. apiculatum* are about 1 mm. in diameter, with pale or whitish leaves, and put one in mind of miniature onions; the capsules are globoid and reddish, the verruculose spores 30-40 mic. diameter.

Of the other seven *Acaulon* species that have been recorded for Australia, *A. brisbanicum* C.M. [*Limnæa* 37: 144 (1871)] from Queensland is an *Astonium*, while the types of *A. austro-muticum*, *A. integrifolium*, *A. sullivanii* and *A. turgidum* can not be separated from the usual form of *A. apiculatum* (see synonymy below). I have not seen the types of *A. crassiusculum* Broth. (*nomen nudum*?) and *A. robustum* Broth. in Roth [*Hedvigia* 53: 94 (1912)]—both from New South Wales—but, when critically investigated, they will probably be found identical with *A. apiculatum* too.

***Acaulon apiculatum* (Hk.f. & Wils.) Jaeg. in Musci Cleist. 20 (1869) — N.Z. type**

Phasium apiculatum Hk.f. & Wils. in *Flora N.Z.* 2: 58, T.83, fig. 1 (1854).
P. apiculatum, var. *turgidum* Mitt. ex Wils. in *Flora Tas.* 2: 164 (1858) —

—Tas. type.

Acaulon austro-muticum Geheeb in *Borch in Heddigia* 34: 272 (1814) —

N.S.W. type.

A. integrifolium C.M. in *Bot. Zeit.* 745 (1853) — Vic. type.

A. sullivanii C.M. in *Flora No. 1*, 1888 — Vic. type.

A. turgidum (Mitt. ex Wils.) Mitt. in *Proc. Roy. Soc. Vic.* 19: 58 (1883) —

—Tas. type.

Victorian collections:

Yarra R. near Melbourne, on bare ground (F. Mueller, ca. 1853—TYPE *A. integrifolium* C.M.); near Melbourne Botanic Gardens (R. A. Bastow, Aug. 1896); Heyington, on shady bank of Yarra R. (W. W. Watts, Sept. 1902); Buninyong, 8 miles S. of Ballarat (R. A. Bastow, Sept. 1898); Mt. Ararat (D. Sullivan, Oct. 1882—TYPE *A. sullivanii* C.M.); Batt's Ridges, 7 miles W. of Portland (Cliff. Beaughole, Sept. 1948); County of Borung at Yarriambiack Ck. and also near Dimboola, on heavy dark clay (F. M. Reader, Aug. 1903); S. Aust. border in Hambadin Parish, 17 miles

N. of Serviceton, on damp sandy flats in mallee scrub (J. H. Willis, Sept. 1949); Kulkyne National Forest near Hattah (Cliff. Beauglehole, 1948).

A. apiculatum, var. **aristatum** J. H. Willis var. nov.:

A forma typica speciei costis longe excurrentibus aristis laxas formantibus, cellulis prope apicem folii magnis (circiter 40-50 X 15-25 mic.) tenuatis laxis (nunquam parvis incrassatis) differt.

Loc.: Herribee Tank, 62 miles west of Mildura, Victoria—damp red clay-loam rainfall ca. 10" p.ann. (J. H. Willis, No. 46, Aug. 29, 1948. TYPE in Herbaria MEL, J. H. Willis & G. O. K. Sainsbury).

Known only from the single collection, this new variety may be distinguished by its long-excurrent nerve and lax apical areolation (cells larger above than in typical *A. apiculatum* and never incrassate).

POTTIA Fühnr. species display more diversity than those of *Asaulon*, and Brotherus gave the number as about 50 in 1924. Although characteristic of plain country (including mallee sandhills and arid limestone tracts) they are known from coastal saltmarsh and suburban gardens in southern Victoria. An elongated seta (several millimetres long) is present, the operculum may be deciduous or persistent but always apiculate, the peristome very short or absent and the spores smooth or with various excrescences; capsules are often lustrous as in *Astanum cylindricum*. Four species are definitely known to occur in Victoria, but it is probable that the boreal *P. heimi* (Hedw.) Fühnr.—recorded for Tasmania and New Zealand—and West Australian *P. scabrifolia* Barr. (1951) will eventually be found here also; the latter is very closely related to *P. davalliana* (with echinulate spores) and was collected on calcareous earth at Streaky Bay, S. Aust., by A. J. Hicks in July 1952. I have examined the type of *Pottia brachyodus* (Hpe., sub *Anacalypta* 1860) Jaeg. and find it referable to *Dematodon convolutus* (Brid.) Grout. *P. recurvumucronata* C.M. is a *nomen nudum*; I have not been able to see the collection representing this name and have no idea what species may be involved.

Artificial Key to Victorian Pottia Species

- Margins of leaves plane; cells clear, rarely somewhat papillose.
Capsule deoperculate, flaking away from a median zone of dehiscence; leaves minute, less than 1 mm. long .. *P. drummondii*
- Capsule with deciduous, obliquely rostrate operculum and well-defined mouth; leaves about 2 mm. long *P. truncata*
- Margins of minute leaves strongly revolute; cells obscure and papillose (capsule operculate),
Peristome present (of short, blunt, pale papillose teeth);
spores about 25 mic. wide, almost smooth or with shallow rounded tubercles ("like miniature bags filled with apples")
..... *P. starkiana*
- Peristome absent; spores 25-35 mic., acutely papillose .. *P. davalliana*

***Pottia drummondii* (Wils.) J. H. Willis comb. nov.**

Phascum drummondii Wils. in *Lond. Journ. Bot.* 7: 26, T. 1a (1846)—W.A. type

Phascum drummondii C.M. in *Flora* No. 1 (1888)—Vic. type.

Pottia drummondii (C.M.) Broth. in *Nat. Pflanzensf.* 1, pt. 3: 423 (1902)

Victorian collections:

Livingstone Ck., Omeo (J. Stirling—collection not examined); Sunday Island, Corner Inlet, in saltmarsh under *Arthrocnemum* (Coryl Skewes, Sept. 1952); Quail Island, Western Port, in saltmarsh with *Salicornia* (E. Dakin,

Sept. 1952); Melbourne, on bare ground (F. M. Adamson, May 1854); Castlemaine (F. Robbins, Aug. 1943); Logan, 12 miles E. of St. Arnaud, on bare clay soil (R. D. Lee, Sept. 1951); Moyston (D. Sullivan, Oct. 1882—TYPE *Phascum drummipens* C.M.).

Through the courtesy of Dr. G. Taylor, Keeper of Botany at the British Museum (Natural History) I have been enabled to study the type of Wilson's *Phascum drummondii* (from Swan River, W.A.). It is clearly the same moss as C. Müller's *P. disrumpens* from near the Victorian Grampians (TYPE in Herbarium MEL), and, as both are referable to *Pottia*, the earlier epithet must be adopted and the combination *Pottia drummondii* established (as above).

***P. drummondii*, var. *obscura* J. H. Willis var. nov.:**

A forma usitata speciei foliis acutis, costis percurrentibus, cellulis paulum obscuris plus minusve papillois, sporis maximis (30-40 mic.) craze verruculosae differt.

Loc.: Sandy desert, Dimboola Shire, Victoria—on ground (F. M. Reader, Aug. 1, 1897. TYPE in Herbarium MEL, as "*Phascum molle*" C.M. ined.); Yarriambiack Ck., near Warracknabeal, Vic.—on damp clay with *Acaulon* (F. M. Reader, Aug. 1903).

This *Wimmera* variant is distinguished from the usual form of the species by its more acute leaves with percurrent nerves, rather obscure areolation and rather larger, quite verruculose spores (almost smooth in the typical plant).

***P. truncata* (Hedw.) Fühnr. in *Flora* 12, pt. 2, Erg.: 25 (1829)—Germ. type.**

Gymnostomum truncatum Hedw. in *Sp. Musc. Frond.* 30 (1801).

Pottia truncatula Lindb. in *Europ. Trichoz.* 5 (1864)—Europ. type.

P. readeri C.M. in *Hedwigia* 37: 152 (1898)—Vic. type.

P. subphyscomitrioides Broth. in *Proc. Linn. Soc. N.S.W.* 41: 582 (1916)—Vic. type.

P. melbourniana Dixon ex Weymouth & Rodway in *Papers & Proc. Roy. Soc. Tas.* for 1921: 174 (1922)—Tas. & Vic. type.

Victorian collections:

Melbourne and suburbs, on garden paths, etc. (F. M. Reader, June 1884—TYPE *P. readeri* C.M.; W. W. Watts, Sept. 1902—TYPE *P. subphyscomitrioides* Broth.; R. A. Bastow, Oct. 1901; J. H. Willis, July 1939 & June 1941; E. Dakin, July 1951); Vermont (H. T. Clifford, Sept. 1952); Croydon (H. T. Clifford, June 1951); Buninyong, 8 miles S. of Ballarat (R. A. Bastow, Sept. 1898); McVean's Springs, Lake Corangamite (Coryl Skewes, Oct. 1951); Goræ West & Mr. Eccles, W. of Portland (Cliff. Beaughole, Sept. 1952).

It is possible that some, at least, of the Victorian populations of this boreal species (particularly those occurring in the metropolis) have been introduced from abroad, as with *Barbula unguiculata*. I concur with Mr. G. O. K. Sainsbury's treatment of *Pottia subphyscomitrioides* and *P. melbourniana* [*Papers & Proc. Roy. Soc. Tas.* 87: 84 (1953)] and examination of type *P. readeri* convinces me that this must likewise be relegated to *P. truncata*—Brotherus was not justified in merging it with *P. intermedia* (Turn.) Fühnr., a species distinguished by papillose leaves with revolute margins.

***P. storkeana* (Hedw.) C.M. in *Syn. Musc.* 1: 547 (1849)—Germ. type.**

Wassia storckeana Hedw. in *Sp. Musc. Frond.* 65 (1801).

Anacalypta capitulosa C.M. & Hpe. in *Linnaea* 26: 491 (1853)—S. Aust. type.

Pottia capitulosa (C.M. & Hpe.) Paris in *Index Bryol.* 1020 (1897).

P. brachyphylla Hpe. nomen nudum—Vic. type.

Victorian collections:

"County of Boring", on clayey soil (F. M. Reader, Aug. 1903); "County of Lowan", Dimboola Shire, in sandy soil (F. M. Reader, Sept. 1898 & July 1900, as "*P. brachyphylla*" Hpe.); Salt Lake at Lochiel, on clayey soil (F. M. Reader, July 1896); Dimboola National Park (Cliff. Beazlehole, Nov. 1949); Berribee Tank, 62 miles W. of Mildura, on damp red loam (J. H. Willis, Sept. 1948); 6 miles E. of Quambatook (Isabel Ritchie, Young Farmers' Club, Oct. 1953); Mt. Jeffcott near Donald (I. O. Marns, Sept. 1953); Broadmeadows, on heavy basaltic soil (R. D. Lee, Aug. 1952); Yarra R. (F. Mueller—collection not examined).

C. Warnstorf had intimated that *P. caespitulosa* was identical with the boreal *P. starkeana*, an opinion with which (having examined Müller and Hampe's Mt. Lofly type of *Anacalypta caespitulosa* in Herbaria MEL) I entirely agree. I have not seen the specimen "on *Quercus eliffortiana*", upon which Hampe proposed to base his *P. brachyphylla*, but suspect that it belongs here also.

P. dovalliana (Sm.) C. Jens in *Danmarks Mosser* 2, 342 (1923)—Switzerland type.

Gymnostomum dovallianum Sm. in *König & Sims Ann. Bot.* 1: 577 (1805).
G. minutulum Schw. in *Sp. Musc. Frond. Suppl.* 1: 25, T. 9 (1811)—Switz. type.

Pottia minutula (Schw.) Furt. in *Flora* 12, pt. 2, Grn.: 23 (1829)

?*G. brevicaulis* Tayl. in *Leod. Journ. Bot.* 5: 42 (1846)—W.A. type.

?*P. brevicaulis* (Tayl.) C.M. in *Syn. Musc.* 1: 556 (1849).

Victorian collections:

Queenscliff (F. Mueller, Sept. 1867); "Avonhurst", St. Kilda Rd., Melbourne, on garden path (W. W. Watts, Sept. 1902—det. Brotherus as *P. brevicaulis*).

I have not been able to inspect Taylor's original material of *Gymnostomum brevicaulis* (from Swan River, W.A.); but Wilson stated on page 447 of the same volume in which it was published: "seems scarcely different from *Pottia minutula*, var. *obtusula*". Moreover, the St. Kilda Road collection which Brotherus identified as *Pottia brevicaulis* is quite similar to European examples of *P. dovalliana* (syn. *P. minutula*), and I strongly suspect that the Australian plant is no more than a form of the latter.

HALL'S GAP ANNUAL WILDFLOWER EXHIBITION

By J. S. SEATON

The show of Australian wildflowers staged at Hall's Gap from October 2-11 compared favourably with the high standard of previous years. As my holidays in the Grampians coincided with this event, I was able to assist in collecting the flowers and in naming the specimens that were sent from Perth, W.A.

Country people show a remarkable interest in this exhibition, for on the Sunday, which was very showery, about 2,000 attended. The hall is really far too small for a crowd of this magnitude, and it is proposed to build a bigger one in the near future.

Typical samples of the more spectacular species in the large Grampians flora comprised the bulk of material displayed, e.g. *Thryptomenes calycina*, *Micromyrtus ciliatus*, *Lhatskyia alpestris*, *Calytrix sullivanii*, *Prostanthera rotundifolia* (an excellent form from Mt. Zero), *Calceolaria cyanea*, *Grevillea alpina* (both prostrate and upright forms from the northern Grampians), *Boronia pinnata* (the usual pink and pure white form), *Epacris impressa* (some good specimens although late), and a goodly collection of orchids. Mr. G. A. Hateley, of "Hill Crest", Stawell, sent a fine collection of his

cultivated eucalypts, together with other shrubs; these added much interest to the display.

Wildflowers sent from Perth included *Amegathos manglesi*, *Leschenaultia biloba*, *Conospermum*, *Verticordia* and *Grevillea* species; as usual, they were a most popular feature.

The annual Hall's Gap exhibition has undoubted educational value, if only to afford people an opportunity of admiring and learning the names of native flowers which they would never otherwise see. Criticism is often levelled at the picking of flowers for this purpose, but I would like to defend this show on the following grounds:

1. Permits are issued by the Forests Commission for all exhibits obtained on Crown Lands.
2. Some of the flowers are collected from private property.
3. Most flowers are collected far away from tourist tracks and roads.
4. Those authorized to collect are responsible people in Hall's Gap who fully appreciate what their wildflowers mean to the district.
5. Judicious picking of flowers can prove beneficial to the plant by acting as a pruning.

Mr. R. Mair, Forester at Hall's Gap, has been most co-operative, advising not only the location of many species but where the best flowers may be obtained at a particular time.

When the proposed new building at Hall's Gap increases the facilities for staging, it is safe to predict that this annual exhibition of wildflowers will rank among the very best in the Commonwealth.

LABILLARDIÈRE'S PLANT NAMES

By THOMAS S. HART

Labillardière the distinguished botanist of the expedition under D'Entrecasteaux, in search of La Perouse, wrote an account of the voyage, published in 1799, and a botanical work in Latin, *Novae Hollandiae Plantarum Specimen* (1804-6). Both are available at the Melbourne Public Library, the "Voyage" in the English edition of 1802 as well as the original French.

In the Latin work he regularly explains new generic names and gives reasons for them, the Greek roots used for most of the names being interpreted by Latin equivalents, but many of the words in both languages are quite familiar to us.

For the smaller number of names given originally in the "Voyage" we find his meaning in the context, more or less explicitly stated in narrative form. As a few were rather puzzling, a study of his method of forming names was undertaken with some results of considerable interest.

1. It appears at once that his names are mostly smooth-running words of three or four or occasionally five syllables quite usable as vernaculars if needed, even the longer ones presenting no difficulty in pronunciation.

2. Most of the names are formed from Greek words, usually of two such words combined.

3. The characters of the plant on which the names are based are well-chosen features. A name, of course, is not a description, but a reminder of some leading point.

4. The Greek roots are also well-chosen with attention to some fine distinctions of meaning.

5. Euphony is treated as important; hence the ordinary usages in forming compound words are often not adhered to. Letters may be omitted, softened or even added to get a neat name.

6. As a Frenchman he has less use for some groups of letters which we use; *th* is not different from *t*, and *st*; and especially *str*, are much less frequent in French than in English.

The well-known *Calytrix* illustrates his method—*Calyx*, or cup, used in its botanical sense, and *trich* or *thrix*, a single hair or bristle explained as Latin *seta*. He could not have well chosen a more suitable feature than this bristle or single hair on the end of the calyx lobes. The word *calyx* really has a second *k* sound in the *x* and *trix* is not exactly either Greek form of the word, but a short and euphonious form is attained. *Calyx-o-thrix*, used by Mueller and earlier, is what would be called more correct by usual methods, but it is worth noting that Mueller still calls it by Labillardière's name.

But *comè* in *Comesperma* is hair collectively, hair of the head, referring to the hairs on the seed, and yet another is used in *Atherosperma*, *ather* the beard of barley, or barbs of a spear, referring to the plumose awns of the fruitlets. He knows, of course, that these matured carpels are really fruitlets but he acknowledges a popular usage by inserting "seeds if they wish".

Atherosperma, our *Sassafras*, is correct in form by usual rules, but the name is easy and we need not grudge the fine plant a rather more striking name than usual.

Lepidosperma, as it stands, is also formally correct, but he derives it from the adjective *lepidotus*, with scales, and drops the *l*. Incidentally, this is the most characteristic Australian group of sedges, limited to Australia and a few in the islands and south China. The other large sedge genera are of wide distribution.

Of the earlier names in the "Voyage" some are easy enough from the context.

"A fine plant of a new genus very distinct from all that have been so far described. It is an Irid with two stamens. I have given it because of this singularity the name of *Diplarrhena*. The affinity with the genus *Moraea* caused me to give it the name *Diplarrhena moraea*" (our Butterfly Flag).

Again, "I soon found an evergreen tree of which the nut (*amande*) is after the manner of the cashew nut situated on a fleshy stalk much larger than itself. I have given for this reason to this new genus the name of *Exocarphus*". *Exo* outside, *carpos* fruit. This is the Wild Cherry or Cherry Ballart. There is no mystery about the nature of the fruit and fleshy stalk.

Angioanthus for the Kangaroo Paw is rather more difficult. The unequal lobes at the end of the tubular perianth are mentioned. Benthani, who rarely explains names in the *Flora Australiensis*, says definitely *anisos* unequal altered for Euphony—no doubt to avoid the repeated *s*.

We may note that Labillardière treats these older names as adequately explained as he does not offer any further explanation in the "specimen".

We then come to *Chorizema*, which was actually the name which started the search. A derivation from *choros* a dance is given as a conjecture in Curtis' Botanical Magazine 1807, *semia* punishment being suggested for the latter part—"as we suppose from the inconvenience its spinous leaves must occasion to the naked footed dancers of that country". The plant was a prickly-leaved species of this genus. This represents dictionary work with the attendant dangers of the method and without due reference to the narrative. The Greek has distinct letters for the short *o* and the long *o*, and the long *a* is at the end of the alphabet well separated from the other and liable to be overlooked.

The derivation from *choros*—a dance is given also by Don 1832 but the latter part of the name altered to *sema*—a drink. On the previous day after some search they had found usable water in small amount, of no use for the ship's shortage, but ample for their evening meal. Next day, they found many plants including *chorizema*, a pea with separate stamens. The narrative clearly fits *chorizo*—I separate—and *nema*—filament of the stamen, the *n* elected for euphony and shortening the name. This treatment of the name is fully supported by Labillardière's *Campynema*, explicitly given in the

"specimen" from *Campylas*—curved, and *nema*—filament of the stamen, the *l* being dropped out. But *chorizema* also agrees with Labillardière's use of well-chosen features. The *Podalyria* section of the Pea Family has this feature of free filaments. *Podalyria* itself, and a very few other genera, are South African, there are a few in America but only one species of this section in Europe. Three-quarters of this section are Australian including several important genera and this plant was the first of this group found by Labillardière. With most local observers following Bentham and Mueller the group is very well known.

Murray's Dictionary gives *Chorizema* pronounced with the *o* long and derived from *Choriza*. The difference in pronunciation at once sorts out the words related to *Chorox*. The correct derivation is not a fresh discovery.

As Mr. Robinson of Dutton remarked in a former discussion, "It is a good plant and a good name," and it is none the worse for knowing the author's ability in making good names.

NATURALISTS' NOTEBOOK

[Reserved for your notes, observations and queries]

COOTS IN GIPPSLAND LAKES

During 1952 two major floods—in June and December—occurred in the river-system which flows into the Gippsland Lakes. As a result, the waters of the lakes remained in a comparatively fresh condition over a period of from 8 to 9 months. This has been followed by the reappearance of extensive weed-beds in parts of the lakes where marine growth has been absent for many years past. This change has, in turn, brought to the lakes area countless numbers of Coots (*Fulica atra*), which obviously are finding in the weed-beds an abundance of food. Many Crested Grebes (*Podiceps cristatus*) have also, at times, been observed. Although Coots have always been more or less plentiful in the lagoons and morasses adjacent to the rivers, I have no previous record of their occurrence in such numbers in the open lakes.

These changes should be of particular interest to marine-biologists and others who have been appointed to investigate the effects of increasing salinity in the waters of the Gippsland Lakes in relation to changes in marine and marginal growth, erosion, etc.

—FRED. C. W. BARTON.

CATERPILLAR CULPRITS

[From *The Countryman*, Vol. 42, No. 2, 1950]

Gardeners already have no cause to love the large cabbage white butterflies, which swarm across the continent each spring. It is their caterpillars, of course, which devour our green vegetables later in the year. Now it seems that poultry keepers, too, have a case against them. The latest "Report on Animal Health Services" (H.M.S.O., 1/6) records several outbreaks of a disease of ducklings which produced a sudden high mortality, and they were all among birds that had had access to caterpillar-infested greens. In every case investigated, the caterpillar of the large white butterfly was involved, and its poisonous nature was confirmed by experimental feeding. Fowls are less susceptible, but, when next the cabbages are being eaten by caterpillars, do not risk turning poultry on to them."

—Submitted by J. W. Raff.

BUTTERFLIES ON MUD

There is, fortunately, no necessity to travel to either Oxfordshire in England, or Grosso in Brazil, to determine whether or not butterflies absorb water from damp ground, for Innes's observation can be confirmed in Australia. (See *Vict. Nat.* 70: 127—Nov. 1953.)

During the war years, about 1941, I spent a few weeks collecting in South Australia. One day, in the vicinity of the Morialto Falls, in the hills near Adelaide, I was enchanted by myriads of the beautiful "Wanderer" butterfly, *Danaida archippus* Fabr. The insects were so numerous that the trees appeared to be draped with autumn's russet foliage. A blow on any trunk would, however, cause the eruption of a most amazing cloud of fragments of gold-leaf fluttering against the dark rocky walls of the canyon. It is an unforgettable memory.

The pupa is of the loveliest shade of emerald-green, with a minute delicate "necklet" of gold beads, but just before hatching, the pupal case becomes purple. It was possible to secure, without any great effort, pictures of every stage of the life-history,—eggs, larvae, feeding, pupae emerging, and adults. No detail was hidden from the naturalist. Later, the photographs and the story were published in *Walkabout* magazine. The "Wild Cotton" plants (*Asclepias physocarpa*) on which the green-striped larva feed, were growing everywhere, and on every little patch of damp sand washed down the tunnels between the rocks, there were hundreds of "Wanderers" resting quietly as they pressed the proboscis into the moisture.

—TARLTON RAYMENT.

FESTIVAL OF THE PERSIAN PLUMS

Christmas is usually celebrated at Toorak, Victoria, by the carols of numerous birds assembling at dawn for the annual "Festival of the Persian Plums". From the earliest hours of the morning, the birds arrive in flocks to shriek, tussle and quarrel as they feast on the dark-red fruits, until the local gentry are driven from bed and sleep. But this year, surprisingly enough, there are no birds at the Festival of the Persian Plums, and the owners of the gardens can sleep on undisturbed by the revelries in the trees. And the reason? The birds have departed to breakfast on the abundant insect life. It is evident that a meat diet is preferred to a vegetable menu. When insects are as abundant as they were in December 1953, then the fruit trees are neglected. The absence of the birds from this annual feast makes one ponder: Have they departed from their usual haunts to take a table at the "Feast of the Grasshoppers" in our ravaged northern areas? Seagulls once suddenly appeared like a miracle to clean up a locust invasion in Utah (U.S.A.), which is hundreds of miles from the sea.

—LYNETTE YOUNG.

WHAT, WHERE AND WHEN

Sunday, January 17—Botany Group Excursion to Sherbrooke Forest. Subject: Ferns. Take either 8.48 a.m. or 8.55 a.m. Upper Ferntree Gully train; then bus to Kallista. Bring one meal.

Monday, February 1 (Australia Day)—Parlor coach excursion to Lorne. Coach leaves Batman Avenue 8.15 a.m., returns 8.15 p.m. Fare 18/-. Bookings with K. Atkins, Botanic Gardens, South Yarra, S.E. 1

Sunday, February 7—Geology group excursion to Grice's Creek. Subject: Fossils. Leaders: Frankston Field Naturalists Club. Take 8.45 a.m. or 8.53 a.m. train to Frankston, then Mount Martha bus to Sunnyside Road. Bring one meal.

—KENNETH W. ATKINS, Excursion Secretary.

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PROCEEDINGS

At the General Meeting held at the Herbarium on January 11, 1954, about one hundred members and friends were present. In the absence of the President, the chair was taken by Mr. Sarovich, Vice-President.

Mrs. E. A. Snow and Miss Beryl Mason were elected as Ordinary Members, and Andrew W. B. Vial as Junior Member.

The Secretary read letters from the Bread and Cheese Club asking for the assistance of the Club in putting the aboriginal cemetery at Coranderruk in order, and from Mr. Ros Garnet and Miss K. Thomas protesting against views expressed in a report in the January *Naturalist* on the Hall's Gap Wildflower Show. All were referred to the Council for attention.

It being Members' Night, several gave short addresses. Miss Ina Watson showed some excellent Kodachrome slides of North Queensland flora and fauna, taken during the recent R.A.O.U. camp-out. Mr. Stan Colliver spoke of his work at the Brisbane University, especially referring to a mural showing Australian prehistoric animal and bird life. Mr. Paul Fisch showed some 8 mm. films taken at Lake Mountain and Cape Shanck. Mr. Noel Lothian, of Adelaide Botanic Gardens, spoke of the suitability of Adelaide for the growing of Australian native flora. Mr. Fred Lewis showed specimens of the Gippsland giant earthworm's egg, found three miles north of Warragul, which greatly extended the known habitat of this creature. Mr. George Coghill spoke of his experiences at Mount Buffalo at Christmas time. Mr. Tarlton Rayment discussed a book he had read recently on animal behaviour.

The Chairman asked if any members had comments to make on the Rosebud foreshore problem, and for volunteers to act on the proposed Youth Movements Committee. He also announced the Wild Life and Flower Show at Hobart at the end of January.

The meeting was adjourned at 9.50 p.m. for the usual *conversazione*.

EXCURSION TO SEVILLE

The Club excursion to Seville, on November 29, 1953, was attended by about twenty persons, including six from the Burnley School of Horticulture Wild Life Club. As Seville Railway Station is in splendid bushland, it made an excellent starting point for a naturalists' ramble. Forty species of birds were noted, and five of these were nesting. Wildflowers were plentiful, and four species of *Eucalyptus* were seen as we passed.

—E. S. HANKS.

CLUB EXCURSION TO BENDIGO WHIPSTICK

On August 30, 1953, twenty-five local naturalists accompanied the twelve Melbourne Club members on a visit to the environs of their city. At Huntly North the Pallid Cuckoo and Grey-crowned Babbler were calling amongst the rounded yellow masses of hakea and wattle, and the nest of a White-fronted Chat was found in a scrubby cassinia bush. The two blue-grey fledglings gaped their yellow mouths wide when the nest was investigated, and the plaintive "tang-tang" of the parents was heard nearby.

At the hunch place, Grey Box and Red Ironbark towered above thickets of the Bull Mallee and Green Mallee and three species of Honey-myrtle. Besides the pale-flowered Spreading Acacia, there were two forms of Golden Wattle, the first normal but the second a dense compact shrub with narrow phyllodes. Gold-dust Acacia formed low clumps, Spoon Acacia displayed its red buds, Shrubby Shookie wore masses of scarlet flower-spikes and bushes of the white-flowered Silky Hakea were scattered about. Leafless Currant-bush provided edible rather acid berries, and Ruddy Beard-heath showed an array of hanging drupes along its wiry branches. Pure white flowers of the Climbing Sundew nodded in the breeze, the dull red flowers of Rosy Heath-myrtle trailed about, and a few flowers of the Blue Caladenia caused comment.

In partly cleared places Peach-heath glowed with red buds, and on a nearby rise, the smoky foliage of Blue Mallee contrasted picturesquely with the black trunks, red branches and silvery foliage of the Ironbarks.

One Bendigo member observed one of the Gilbert Whistlers which, with the Crested Bellbird, could be heard calling. Red Wattle-Birds uttered their harsh notes and the Brown Flycatcher, Restless Flycatcher and the inevitable White-winged Choughs were seen here and there. Five species of Honey-eater were seen, each with its characteristic call—the scolding of the White-naped species, the loud "chop-chop" of the White-eared, the "loh-hoh" of the Fuscous, the high-pitched notes of the Yellow-tufted, and finally the mournful Aule-like call of the Tawny-crowned. Though typically coastal, this last species has been frequently observed in the Bendigo Mallee area.

The party moved westward through stands of Grey Box and Yellow Gum, and, after inspecting stacks of Green Mallee at a crude eucalyptus-still, arrived at Flagstaff Hill. Here were green patches of Matted Bush-pea, pink flowers of Small Crowea, the ashy-grey Mountain Grevillea, silvery clumps of Drooping Cassinia, and the rather uncommon Club-leaf Phebalium showing a few white flowers. Parties of Purple-backed Wrens and the mouse-like Shy Ground-Wrens flitted about, Eastern White-faces mingled with Yellow-tailed Thornbills, and a Fantail Cuckoo trilled mournfully from a large shrub.

A stop was made finally at the Eaglehawk Rifle Range, to inspect white-blossomed Fairy Wax-flower, Small-leaf Wax-flower, the mauve-blue Shrub Violet and the pink-spiked Sticky Boronia. Narrow-leaf Logania grew six feet high and displayed its sweet white flowers, and brown blooms of the Leopard Orchid showed through the ground cover.

Thirty years ago, the late D. J. Paton remarked on the unusual abundance of the Large Dodder-laurel and the absence of Drooping Mistletoe. [See "Plants of the Whipstick Scrub", *Vict. Nat.*, February 1924.] A watch throughout the day indicated that this is still the case, for though the former smothers square yards of vegetation, the latter is apparently absent.

—KENNETH W. ATKINS.

NATURE NOTES AND EXHIBITS

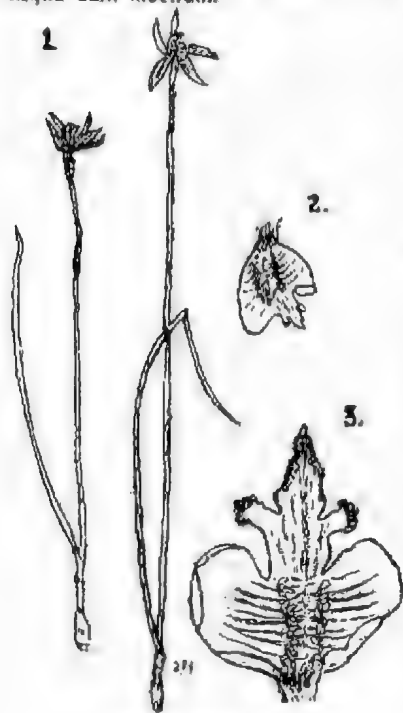
Members giving nature notes or showing exhibits at Club meetings are requested to supply the Exhibits Steward or the Editor with brief written summaries for inclusion in the *Naturalist*.

ORCHID NOTES FROM NORTH OF THE MURRAY

By the Rev. H. M. R. Ruff, Willoughby, N.S.W.

I. A NEW SPECIES OF *CALADENIA* FOR NEW SOUTH WALES
C. HOLMESII, sp. nov.

Planta parva, gracillima, 10-17 cm. alta. Caulis bractea laxa, filiformis. Folium lineare, usque ad 11 cm. longum. Flos solitarius, rubro-purpureus. Sepala petalaeque fere aequalia, angustissima, circa 1 cm. longa, glandulosa. Labellum et columna cum lineis transversis pullissimis. Labelli lobi laterales magni, integri; lobus intermedius pallidus, *trilobatus*; lobus centralis acuminatus, vix reflexus; lobi laterales obtusissimi, ad apices glanduloso-papilloso. Disci calli in ordinibus duobus ad lobi intermedii basem patententes. Columna usque dum labellum.

*Caladenia holmesii*, sp. nov.

(Drawings by Mrs. Joyce Teller)

1. Plant, natural size.
2. Labellum, enlarged, showing one lateral lobe much reflexed.
3. Labellum greatly enlarged, to show the character of the trilobate mid-lobe.

A small and very slender plant 10-17 cm. high. Stem-bract filiform, loose. Leaf linear, up to 11 cm. long, erect. Flower solitary, rich reddish-purple. Sepals and petals almost equal, very narrow, glandular-papillose, about 1 cm. long, acute. Labellum and column traversed by very dark transverse striae. Lateral lobes of labellum large, with entire margins; mid-lobe pale, *trilobate*, the central lobe acuminate, scarcely reflexed, with irregularly roughened margins, the side lobes very obtuse, with glandular-papillose apices. Calli of the disc yellowish, in two dense rows, so arranged as to give the impression of two *double rows*; extending from the base of the disc to the base of the mid-lobe, the anterior and posterior calli longer than those in between. Column as long as the labellum.

This beautiful little orchid was at first suspected to be yet another variety of the polymorphic species *C. carnea* R.Br. The character of the labellum, however, is very distinctive, the mid-lobe itself being conspicuously three-lobed. The discal calli also arrest attention. Although really only in two rows, they lean outwards and inwards alternatively, giving the impression that there are four rows.

Wyong, New South Wales; August 1952 and September 1953; leg. L. Holmes.

Mr. Holmes, who is an officer of the Forestry Department of N.S.W., states that the new species has been found growing only among the roots

and in the shade of *Lambertia formosa*, a shrub usually known as "Honey Flower". This habit makes its rich colouring the more remarkable, since specimens of *Coladenia* growing in shady places are generally pale. It is not common, but has been found in sufficient numbers to warrant its publication as a new species. For the excellent illustration of the new species, which is named after its discoverer, I am indebted to Mrs. Joyce Telfer, of Mosman, N.S.W., who has made a careful study of several specimens.

II. NEW RECORDS

(a) The Rev. B. W. Lowery, S.J., whose investigations of our orchid flora are not unknown to Victorian orchidologists, has made some interesting discoveries in the outer northern suburban bushlands near Sydney. In June 1953, to my surprise and pleasure, he sent in flowering specimens of *Corybas undulatus* from the Wakehurst Parkway on the eastern side of Middle Harbour. It may be remembered that in 1928 I "re-discovered" this little Helmet Orchid at Bulahdelah after it had been lost to botanists for more than 90 years. Subsequently it was found in southern Queensland; but until the present year (1953) all efforts to discover it anywhere in the Port Jackson area met with no success. Another "find" of much interest, by the same observer, is that of *Coladenia iridescens*, which was collected in the neighbourhood of Elanora Heights, beyond Narrabeen. Previously there was no record of this species in New South Wales farther north than Yass.

(b) Mr. B. McCarthy, of Cessnock, has sent flowers of an epiphyte which he found on the Dividing Range in that area, upon which it is very difficult to express a definite opinion. The plant, he says, bears considerable resemblance to *Sarcophilus hartmannii*. The general aspect of the flowers suggests a large form of *S. falcatus* with narrow sepals and petals. But the labellum is not that of a *Sarcophilus* at all. The lateral lobes are rhomboid; the mid-lobe is acute, concave above, with a few tall calli; and there is no trace of a labellar sac or "spur". If additional specimens can be found, it would appear that this plant belongs to an undescribed genus.

(c) *Dendrobium elobatum*. In this journal for January 1953, I described this as a new species discovered by Mr. Stanley St. Cloud in the mangrove scrubs of Trinity Bay near Cairns, N.Q. Mr. St. Cloud has the type plant growing. Now a reference to the illustration accompanying my description will, I think, convince anyone acquainted with Queensland orchids that it would be difficult to find a *Dendrobium* with flowers more unlike those of the well-known *D. undulatum*. Yet some months later Mr. St. Cloud sent a raceme from the same plant, the flowers of which were almost (but not quite) typical *D. undulatum*! Now he has sent flowers from another raceme, and these are nearly identical with the type flowers, the only distinction of importance being that the labellum has one narrow lateral lobe. How is this remarkable dimorphism to be explained?

(d) *Corybas unguiculatus*. Mr. H. Goldsack reports the discovery of this species at Bridgewater in South Australia. Previously the only species known in that State were *C. diemenicus* and *C. dilatatus*.

(e) Attention may be drawn here to the description by Mr. Trevor Hunt, in the *Australian Orchid Review* for September 1953, of the first species of the genus *Bromheadia* (*B. venusta* Hunt) to be recorded in Australia. It is a tall terrestrial orchid, and occurs in the Weipa Mission area, Gulf of Carpentaria. *Bromheadia* comprises about a dozen species, extending from Burma through Malaya, Indonesia, etc., to Australia.

CRATERELLUS MULTIPLEX Cke. & Mass.

An Uncommon and Remarkable Fungus

By J. H. WILLIS, National Herbarium of Victoria

By comparison with the multitudinous and frequently colourful species of agarics and polyporoids, the family *Thelephoraceae* has little to offer in the way of elegant or attractive fungi—most of them either form rather dingy overlapping brackets of leathery texture or are variously effused as thin crusts over dead wood (e.g. *Corticium* and *Aleurodiscus*). True, there is

the terrestrial *Stereum elegans* which has rosette-like clusters of almost funnel-shaped sporophores, beautifully zoned in cinnamon and darker browns, while *S. hirsutum* and *S. lobatum* brighten up drab stumps and logs with tintings of apricot, orange or old-gold.

The genus *Craterellus* is a welcome departure in form and texture, embracing about 20 species from various parts of the world. By virtue of its membranaceous or almost fleshy context, and the fact that its hymenium is spread over more or less linearly arranged folds or wrinkles (some-what resembling "gills"), a few botanists, including Lloyd (1920), Rea (1922) and Cleland (1934), have placed *Craterellus* in the *Agaricaceae*—a treatment which I followed in the F.N.C.V. fungus handbook, 1950; more recent research, however, indicates undoubted thelephoroid affinities. Four species of *Craterellus* have been recorded for Australia, viz., *C. cornucopioides* (the "horn-of-plenty"), *C. odoratus* (syn. *C. confluent*), *C. pusio* (on mosses and very minute) and *C. multiplex*. The two first are trumpet-shaped, all have been reckoned as rare plants, and only the tiny Tasmanian *C. pusio* does not seem to have been discovered in Victoria.



There can hardly be a more intriguing fungus than *C. multiplex*, with its superimposed leaf-like pilei (yellow above, and pink beneath on the rugose hymenium); but *Polyporus superpositus* Berk. (ranging from N.E. New South Wales through New Guinea to Malaya) shares this unique feature of tiered, unilateral pilei on a common stipe. It is not intended here to duplicate the description given on page 60 of our Club's fungus handbook, but a few additional facts about the plant may not be amiss—if only to stimulate interest and encourage search for future specimens (at present all too few in our herbaria).

The original and type collection was made by Leonard Rodway on the Derwent River, Tasmania, and described by Cooke and Massee in 1889. No further specimens seem to have been found anywhere, until Professor J. B. Cleland recorded an occurrence at Mt. Lofty, South Australia in 1924. Since then at least eleven other collections have been made, six of them in and near the Dandenong Ranges, Victoria (by Associate-Professor Ethel I. McLennan and the writer). The latest appearance was near Beaconsfield (Tas.), and to Mr. T. E. Burns goes the honour of re-discovering *C. multiplex* in Tasmania—the accompanying sketch was drawn from one of his specimens. According to available data, the fruiting time extends from April to August, with an optimum during June (five collections). It is almost certain that occurrences will eventually be reported from New South Wales—probably also from the other two States and New Zealand.

As the sporophores dry out their hymenial colour remains almost unaltered, as a lively pink (near "cupid pink" of Maerz & Paul, *Dictionary of Colour*, 1930) and a pronounced odour develops—somewhat like chestnut flour. Dried samples become exceedingly brittle with age. I find the spores to be abundant, hyaline, globose, glabrous and about 4 mic. in diameter; but I have not examined the hyphal structure. Here follows a list of the eleven known collections, and a bibliography of references to *C. multiplex*:

TASMANIA

Derwent River (L. Rodway, No 658—TYPR at Kew, duplicate in Herb. Melbourne);

Supply River, S.E. of Beaconsfield (T. E. Burns, Aug. 1953—Herb. Melbourne & Vict. Dept. Agric.).

SOUTH AUSTRALIA

Mt. Lofty; base of dead stump (J. B. Cleland, June 1924—Herb. J.B.C.).

VICTORIA

Mt. Clay near Portland; dead fallen branchwood (*C. Beaughole* & P. E. Finck, June, 1953—Herb. Forest Products, C.S. & I.R.O.)

Bolwarrah, N.W. of Ballan; base of dead *Euc. obliqua* (P. E. Fink, July, 1953—Herb. Forest Products, C.S. & I.R.O.).

Creswick; against old dead stumps and grass tussocks—plant with 12 superimposed pilei (J. H. Willis, June, 1931).

Dandenong Ranges: Sherbrooke Forest (J. H. Willis, June, 1933; E. I. McLennan, June, 1934—Herb. Melb. Univ.); Kallista (E. I. McLennan, Aug., 1934—Herb. Melb. Univ.; F. Packe, Apr., 1951); Belgrave (Nancy Robinson, July, 1947—Herb. Forest Products, C.S. & I.R.O.).

Cockatoo Creek (J. H. Willis, June, 1934—Herb. Melb. Univ.).

Blacks' Spur (Norm. Tamblin, July, 1947—Herb. Forest Products, C.S. & I.R.O.).

Bonang and Goongerah, E. Gippsland; well-rotted logs (W. Hunter, Aug., 1944—Herb. Melbourne).

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CHANGES OF NOMENCLATURE OF CERTAIN INSECTS AND ARACHNIDS

LIST 2

By C. E. CHADWICK, Department of Agriculture, Sydney

The following changes in nomenclature of well-known insects are added to those in List 1 (*Vict. Nat.*, Vol. 67, No. 11, pp. 227-230). Abbreviations used are those of the World List of Scientific Periodicals published in the years 1900-1950; Third Edition, 1952.

Present Name	Synonyms	Authority, Remarks, etc.
ORTHOPTERA		
<i>Gryllus commodus</i> (Walker).	<i>Gryllus commodus</i> Walker, 1869 <i>Gryllus fuliginosus</i> Serville (nec Stoll), 1839 <i>Gryllus servillei</i> Saussure, 1877	Kirby, W. F. (1906). A-Synonymic Catalogue of <i>Orthoptera</i> , II, (1), p. 34. Chopard, L. (1951). A Revision of the Australian <i>Grylloidea</i> . <i>Rec. S. Aust. Mus.</i> , IX, (4), 397-533. Common field cricket.
HEMIPTERA		
<i>Austroasca</i> (<i>Austroasca</i>) <i>terrae-reginae</i> (Paoli)	<i>Empoasca terrae-reginae</i> Paoli, 1936 <i>Empoasca maculata</i> Evans, 1942	Lower, H. F. (1951). A Revision of Australian Species Previously Referred to the Genus <i>Empoasca</i> (<i>Cicadellidae</i> , <i>Homoptera</i>). <i>Proc. Linn. Soc. N.S.W.</i> , LXXXVI, (5-6), 190-221.
<i>Austroasca</i> (<i>Austroasca</i>) <i>viridigrisea</i> (Paoli)	<i>Empoasca viridigrisea</i> Paoli, 1936 <i>Empoasca terrae-reginae</i> Evans, 1941	Lower, H. F. (1951). A Revision of the Australian Species Previously Referred to the Genus <i>Empoasca</i> (<i>Cicadellidae</i> , <i>Homoptera</i>). <i>Proc. Linn. Soc. N.S.W.</i> , LXXXVI, (5-6), 190-221. <i>E. terrae-reginae</i> was a misidentification; the species not known outside Queensland. Suggested common name, the vegetable jassid.

Present Name	Synonyms	Authority, Remarks, etc.
HEMIPTERA (Contin.) <i>Orosius argentatus</i> (Evans)	<i>Thamnolettix argentata</i> Evans, 1939	Evans, J. W. (1939). Australian Leaf-Hoppers: Part 8. <i>Pap. Roy. Soc. Tasm.</i> , 1938, 1-18. Evans, J. W. (1947). A Natural Classification of Leaf-Hoppers (<i>Jassoidea</i> , <i>Homoptera</i>). Part 3. <i>Jassidae</i> . <i>Trans. R. Ent. Soc. Lond.</i> , 98, (6), 15 July: 105-271. Common brown jassid.
<i>Unaspis citri</i> (Comstock)	<i>Chionaspis citri</i> Comstock; <i>Chionaspis euonymi</i> Comstock (misidentification) <i>Howardia citri</i> (Comstock)	Ferris, G. F. (1937). Atlas of the Scale Insects of North America. SI-128, SI-129. "In the author's opinion the two genera <i>Prontaspis</i> and <i>Unaspis</i> should be united, the latter name having page precedence and therefore being adopted." For further synonymy see: Fernald, Maria E. (1903). Catalogue of the <i>Coccidae</i> of the World. White louse scale.
COLEOPTERA <i>Anthrenus flavipes</i> Le Conte, 1854	<i>A. vorax</i> Waterhouse, 1883	Barber, H. S. (1951). Another name for the Furniture Carpet Beetle. <i>Coleopt. Bull.</i> , June, V, (3), 44-45. Carpet beetle.
<i>Heteronychus sanctae-helenae</i> Blanchard	<i>H. arator</i> Burmeister, 1847 (nec Fabricius, 1775) <i>H. transvalensis</i> Pering, 1901	Arrow, G. J. (1937). <i>Coleopt. Cat. Berl.</i> , Pars. 156, <i>Dynastinae</i> , p. 31. Britton, E. B. (1951). The Nomenclature of <i>Heteronychus sanctae-helenae</i> Blanchard (<i>Coleoptera</i> ; <i>Scarabaeidae</i> ; <i>Dynastinae</i>). <i>Proc. Linn. Soc. N.S.W.</i> , LXXVI, (3-4), 133-134. "The continued use of the name <i>arator</i> in <i>Heteronychus</i> is inadmissible as it is a secondary homonym. The next available name for the species, <i>Heteronychus sanctae-helenae</i> , Blanchard, 1853, is therefore valid." Black beetle.

Present Name	Synonyms	Authority, Remarks, etc.
COLEOPTERA (Contin.)		
<i>Laemophloeus minutus</i> (Olivier, <i>Cucujus</i> , 1791)	<i>Laemophloeus pauper</i> Sharp, 1899	Steel, W. O., and Howe, R. W. (1952). A New Species of <i>Laemophloeus</i> (Col.: <i>Cucujidae</i>) associated with stored products. <i>Proc. R. Ent. Soc. Lond. (B)</i> , Vol. 21, 5-6, pp. 86-88.
<i>Stethorus vagans</i> (Blackburn)	<i>Scymnus vagans</i> Blackburn, 1892 <i>Stethorus vagans</i> (Blackburn, 1892), Weise, 1908	Flat grain beetle. Kapur, A. P. (1948). On Old World Species of the Genus <i>Stethorus</i> Weisc. (<i>Coleoptera: Coccinellidae</i>). <i>Bull. Ent. Res.</i> , 39, (2), 297-320. Mite-eating ladybird.
HYMENOPTERA		
<i>Lissopimpla excelsa</i> (Costa)	<i>Pimpla excelsa</i> Costa (1862), 1864 <i>Rhyssa semipunctata</i> Kirby, 1883 <i>Lissopimpla semipunctata</i> (Kirby, 1883), Dalla Torre, 1901 <i>Xenopimpla semipunctate</i> (Kirby, 1883), Cameron, 1898 <i>Lissopimpla octoguttata</i> Kriechbaumer, 1889 <i>Lissopimpla 10-notata</i> Kriechbaumer, 1889 <i>Lissopimpla haemorrhoidalis</i> Kriechbaumer, 1889 <i>Lissopimpla excelsa</i> (Costa, 1862, 1864), Schultz, 1912	Parrott, A. W. (1952). New Zealand <i>Ichneumonidae</i> , II. Tribe <i>Echthromorphini</i> (<i>Pimplinae</i>). <i>Trans. Roy. Soc. N.Z.</i> , Vol. 80, Pt. 2, pp. 155-170, 10 figs., Sept. 1952.

Present Name	Synonyms	Authority, Remarks, etc.
HYMENOPTERA (Contin.)		
<i>Monerebia</i> spp.	<i>Abispa</i> spp.	Meade-Waldo, G. (1914). Notes on the <i>Hymenoptera</i> in the Collection of the British Museum, with Descriptions of New Species. V. <i>Ann. Mag. Nat. Hist.</i> , (8), XIV, December, pp. 450-464. On p. 461 states "Saussure wrongly sank his genus <i>Monerebia</i> (1852) to <i>Abispa</i> (1838)."
<i>Mormoniella vitripennis</i> (Walk)	<i>Pteromalus vitripennis</i> Walker, 1836 <i>Pteromalus abnormis</i> Boheman, 1858 <i>Nasonia brevicornis</i> Ashmead, 1904 <i>Mormoniella brevicornis</i> Ashmead, 1904	Edwards, R. L. (1952). The Precedence of the Generic Name <i>Mormoniella</i> Ashmead over that of <i>Nasonia</i> Ashmead (Hym. <i>Pteromalidae</i>). <i>Ent. Mon. Mag.</i> , Vol. LXXXVIII, (Fourth Series, Vol. XIII), Fourth Series, No. 149, No. 1056, May, p. 103. <i>Mormoniella</i> (p. 316) has page priority over <i>Nasonia</i> (p. 317) in Ashmead's revision (Ashmead (1904), Classification of the Chalcid Flies. <i>Memoirs of the Carnegie Museum</i> , Vol. 1, No. 4).
<i>Netelia ephippiatus</i> (Smith)	<i>Paniscus ephippiatus</i> Smith 1876 <i>Paniscus productus</i> Hutton, 1904 <i>Paniscus smithii</i> Dalla Torre, 1901	Sheep blow-fly parasite. Parrott, A. W. (1951). New Zealand <i>Ichneumonidae</i> . Paper No. 1. The Genus <i>Netelia</i> Gray (<i>Paniscus</i> of Authors) (<i>Tryphoninae: Phytodietini</i>). <i>Trans. Roy. Soc. N.Z.</i> , Vol. 79, Pt. 2, pp. 286-293, pl. 40-43, Sept. 1951.
<i>Netelia productus</i> (Brulle)	<i>Paniscus productus</i> Brulle, 1846 <i>Paniscus foveatus</i> Cameron, 1898	Parrott, A. W. (1951). See above.
<i>Platysectra analis</i> (Costa)	<i>Pterygophorus analis</i> Costa, 1864	Benson, R. B. (1938). A Revision of the Genus <i>Pterygophorus</i> , <i>sensu lato</i> , with the Description of Two New Genera (<i>Hymenoptera, Symphyta</i>). <i>Ann. Mag. Nat. Hist.</i> (11), i, (6): pp. 610-625, 12 figs. Ironbark sawfly.

Present Name	Synonyms	Authority, Remarks, etc.
HYMENOPTERA (Contin.)		
<i>Platyséctra interruptus</i> (Klug)	<i>Pterygophorus interruptus</i> Klug, 1814	Benson, R. B. (1938). See above. Cattle poisoning sawfly.
<i>Pseudoperga lewisii</i> (Westwood)	<i>Perga lewisii</i> Westwood, 1864	Benson, R. B. (1939). A Revision of the Australian Sawflies of the Genus <i>Perga</i> Leach, <i>sens lat.</i> (Hymenoptera, Symphyta). <i>Aust. Zool.</i> , Vol. 9, Pt. 3, pp. 324-357. Pale brown sawfly.
<i>Sceliphron lateum</i> (Smith)	<i>Pelopoëus laetus</i> Smith, 1856 <i>Sceliphron (Pelopoëus) laetum</i> (Smith, 1856), Kohl, 1918	Krombein, K. V. (1949). The Aculeate Hymenoptera of Micronesia. I. <i>Scoliidae</i> , <i>Mutillidae</i> , <i>Pompilidae</i> and <i>Sphecidae</i> . <i>Proc. Hawaii. Ent. Soc.</i> , XIII, (3), 367-410.
DIPTERA		
<i>Altermetaponia rubriceps</i> (Macquart)	<i>Metaponia rubriceps</i> Macquart, 1847 <i>Chironmyza fulvicaput</i> Walker, 1856 <i>Cryptoberis herbescens</i> White, 1916	Miller, D. (1950). Catalogue of the Diptera of the New Zealand Sub-Region. <i>Bull. No. 100, D.S.I.R., N.Z.</i> , p. 72.
LEPIDOPTERA		
<i>Pseudaletia australis</i> (Franclemont, 1951)	<i>Cirphis unipuncta</i> (Haworth, 1809), (misidentification)	Franclemont, J. G. (1951). The Species of the <i>Leucania unipuncta</i> Group with a Discussion of the Generic Segregates of <i>Leucania</i> in North America (Lepidoptera, Phalaenidae, Hadeninae). <i>Proc. Ent. Soc. Wash.</i> , Vol. 53, No. 2, April 1951, pp. 57-85. The common army worm.

THOUGHTS ON PLANTS COMMON TO AUSTRALIA AND NEW ZEALAND

By A. E. BROOKS

When Dr. C. E. Sutton compiled his census of the Sandringham Sands flora (*Vict. Nat.*, Vol. 29, No. 6) he listed 460 species of which 120 are found also in New Zealand. These latter, as well as including a proportion of cosmopolitan plants, cover such species as Grass Trigger-Plant (*Strydium graminifolium*), Manuka Tea-tree (*Leptospermum scoparium*), and Soft Tree Fern (*Dicksonia antarctica*). In a recent lecture to the Club, Dr. R. T. Patton referred to plants of the Bogong High Plains, which occur also in New Zealand (*Vict. Nat.*, Vol. 69, No. 11). This effectively reminds us of the strong affinities which the New Zealand flora has with that of Australia.

How is the occurrence of so many species common to the two countries to be explained? Plant seeds can be dispersed for considerable distances by wind, water, or animals, including birds, but the types of plants under consideration do not have seeds which can be conveyed by water, and lack of a land connection and the absence of native animals in New Zealand rule out land animals as a medium for carrying seeds.

Birds readily carry the seeds of succulent berries but the plants we are considering do not have fruits of this kind. It should not be overlooked that birds may convey large numbers of seeds in mud attached mainly to their feet, but other than sea birds and wading birds those common to Australia and New Zealand are limited to a few such as the Spotted Owl, Sacred Kingfisher, Shining Bronze-Cuckoo, Grey Fantail and Grey-backed Silvereye. It does not seem likely that the solution lies in this direction.

While on a visit to New Zealand a few years ago I found the snow on the Southern Alps tinged with red—an effect credited to red dust from the arid areas of Australia. If dust can travel the intervening twelve hundred miles between the two countries then at least the finest of seeds could do the same. It takes more than fifteen million seeds of some orchids to weigh one ounce and among the common plants of Australia and New Zealand are many orchids: Austral Lady's Tresses (*Spiranthes australis*), Red Beards (*Calochilus paludosus*), Slender Sun-orchid (*Thelymitra pauciflora*), Veined Sun-orchid (*T. venosa*), Dwarf Greenhood (*Pterostylis nana*) and others.

Since the Krakatoa explosion of 1882, that island has grown new vegetation, many of the plants having small seeds which could be wind-borne. This island is only about fifty miles from the nearest land mass; but the Azores Islands have a flora similar to that of Europe although they are about nine hundred miles distant at the nearest point. We must conclude, then, that wind-dispersal of some seeds between Australia and New Zealand must be considered a definite possibility.

The other way in which plant species may have travelled between Australia and New Zealand, or to both countries from a common source, is along a land mass which connected them, although this may not have been complete at any one time. Geologists do not believe that Australia and New Zealand were ever connected by land, but the ratite birds of Australia (Emu and Cassowary), New Zealand (Kiwi and the extinct Moa), Africa (Ostrich), and South America (Rhea) suggest that there must have been some connection between all of these countries. There may have been intervening land masses which are now beneath the seas.

In support of the land-chain theory it may be noted in passing that certain plants are common to South America, New Zealand and Australia, e.g. Alpine Euphrasia (*E. antarctica*), White Wood-sorrel (*Oxalis moreslandica*), and Alpine Fern (*Blechnum pennina-marina*), whilst *Pavonia hastata* is common to Australia and South America, and other plants such as the King

Fern (*Todea barbara*) are common to Australia, New Zealand, and South Africa.

It is submitted therefore that Australia and New Zealand were once joined by a land-chain, not necessarily complete at any one time, and that it is possible that seeds of some plants have been wind-borne between the two countries.

MEALY BUGS

By TARTLTON RAYMENT, FR.Z.S.

A cluster of galls, rather larger than the type, were collected by Mrs. D. S. Lewis at Tidal River, Victoria, on November 20, 1953. These galls were abnormal growths of vegetable tissue on trees of the genus *Eucalyptus*, and since the cells grow in a disorganized manner, such galls are analogous with the cancerous growths of the human body.

These strange developments are brought about by a coccid, *Apiomorpha pilcata* Schrader. The insects are peculiar to Australia, where there are more than 40 species known to science. The galls of the males are much smaller than those of the females, and are quite different in form, being somewhat urnlike.

The differences between the sexes are arresting, the females being large and stout, and wingless, and the much smaller, slender males are endowed with a pair of extremely delicate wings. The female is about 16 mm. in length, and 10 mm. broad at the widest part, and is conspicuously white, a splendid opaque white which comes off readily as an impalpable powder, dusting with "snow" everything she touches, including the smooth immaculate interior of the gall—hence the vernacular name "Mealy Bugs". They are in the Family COCCIDAE, and Subfamily APIOMORPHINAE.



EXPLANATION OF TEXT-FIGURE

1. A cluster of female galls of *Apiomorpha pilcata* Schrader.
2. Galls of the males.
3. Section of a female gall showing the immaculate interior.
4. Ventral view of the female.

THE BLACKBIRD'S RIDDLE

By N. A. WAREFIELD

In the early part of the spring of 1953, an English Blackbird built a nest in the garage at my home at Noble Park. The site chosen was right inside, on a narrow ledge against which were leaning some fly-screens, these latter being pushed out almost to overbalancing during the building process. At about the time that the bird laid a clutch of three eggs, the screens were removed and a small piece of three-ply tacked up to hold the nest firm in their stead. This apparently offended the bird, for she thereupon deserted the nest and eggs.

About six weeks later the bird was seen on the nest, and investigation showed that she had laid a second clutch of three eggs and was sitting on all six. Having settled down to the business of hatching, she remained determinedly on the nest even when approached closely. She accepted cheese and buttered bread readily from the hand, even on the first occasion that such was offered, and so was fed regularly. When a piece of food was dropped into the nest and fished out again, the bird simply stood up and strongly pecked the intruding fingers.

Hatching time was awaited with no small interest, for there was the question as to whether three or six chicks would emerge. However, tragedy overtook the little home, and the answer remains uncertain. One morning it was noted that the parent bird was not on the nest, and an examination revealed that there was a single dead chick in it. A careful search failed to bring to light the slightest evidence as to what had happened to the rest of the brood. However, the absence of any sign of broken eggs suggests that all six *did* hatch; for would a predatory rat or cat completely dispose of three addled eggs?

The adult bird survived the disaster. It is readily recognized by its short ragged tail lacking most of the normal long feathers. She is still quite active about the garden, and has since been seen gathering stringybark from the woodheap for another nest. It is hoped that her persistence is better rewarded on this occasion, even though it will mean more raiders on the strawberries and tomatoes.

But there still remains the original question. Did the bird's first three eggs retain their vitality during the several weeks' neglect? Has any reader a suggestion to make on the matter?

NATURALISTS' NOTEBOOK

[Reserved for your notes, observations and queries]

GERMINATION OF GREEN PEAS

I did not have to wait very long for new evidence on the germination of fresh peas. I had hardly digested the note in the *Naturalist* of October 1953 when my wife brought in one of the pods she had been "shelling" for dinner. The peas inside were plump, tender, and very green, and from each of them issued a long strong white radicle. Since the precocious seeds were still enclosed in the sappy pod, it is difficult to see just how they could have survived the long delay before they finally reached the soil. It would appear that the drying of seeds on the plant before they are shed to fall on the ground is a universal law throughout the botanical world, and one that makes for the survival of the species.

—TARLTON RAYMENT.

BLUE-BILLED DUCK ON PHILLIP ISLAND

A bird observation perhaps worth noting is that of a pair of Blue-billed Ducks on the swamp bordering the south side of the Cowes to Rhyll Road, Phillip Island. I stopped the car on the morning of December 22, and was standing near it looking over the swamp, when these two Ducks, the black and chestnut male followed closely by a lighter, freckled mate, swam into an open patch only twenty yards away. They did not dive as I watched them, but swam directly across the open stretch to shelter. Identification could not have been easier.

One point of interest about this observation is that this Duck which Leach mentions as having been "recorded from inland Victoria" was here on a swamp which could hardly have been nearer the coast. Incidentally, Gould knew it from coastal lagoons in Western Australia, and thought it was confined to these. Sharland calls it "probably Tasmania's rarest wild Duck". It is notable, too, that this "shy and wary bird" which "generally keeps . . . well away from the margins of lakes or swamps" (Cayley) was here swimming only a few yards from a motor-road, when even the Swans were skulking behind reeds in the centre of the swamp. It is not often that Nature goes out of her way thus to make things more convenient for the bird-watcher.

—J. LAURIE PROVAN.

SNOWY MINT BUSH

Although Snowy Mint Bush (*Prostanthera nivea*) usually grows no closer to Melbourne than the Yau Yangs or Bacchus Marsh there is a good plant of this shrub growing among manuka scrub at Sandringham.

Has the seed been carried from a garden plant by a bird or even by a mouse, has someone thrown away some pieces of a plant gathered far afield, or scattered some seed, or could it have occurred naturally there? It is interesting to speculate.

When in flower large pieces are often broken from this bush, but this rough form of pruning serves only to make it grow more vigorously and become more shapely.

There is a blue flowered form of the snowy mint bush (*P. nivea induta*) which has whitish stems and makes a good garden plant.

—A.E.B.

FARMING LADYBIRDS

(From *Amateur Gardening*, London, Sept. 25, 1953)

Early in life gardeners are taught to preserve and encourage Ladybirds, because these small, spotted and pretty creatures feed on aphids. From encouraging to "farming" ladybirds is a far cry; nevertheless a man living in Arizona is "farming" them. He has grown tired of the large assortment of insecticides and argues that if nature has provided a means of control, why not take full advantage of it. He estimates that each adult ladybird (lady bugs in America) will consume about 45 pestiferous insects every day, and that they devour other pests besides greenfly. The good man's name is Quick, and it appears that he has built up a quite good business by selling ladybirds at eight dollars a gallon, and a gallon contains about 135,000. He also estimates that 20 gallons of ladybirds will control the insect population on 100 acres of vegetables!

—Submitted by J. W. Raff.

"RAREST BRITISH WILDFLOWER"

[From *The Times Weekly Review*, July 30, 1953]

British botanists are rejoicing in the announcement that our rarest wildflower, the spurred coral-root orchid, *Epipogium aphyllum*, is now flowering in a "southern English woodland". This find was reported in a letter to *The Times* last week by Mr. R. A. Graham, of Middlesex. The exact locality is known only to a very small circle pledged to secrecy. No fewer than 13 examples have been found—a remarkable discovery, since in the plant's known history here only 11 had been found hitherto. The first specimen was found in 1854 by Mrs. W. Anderton Smith on the Herefordshire and Worcestershire border; a second, by another lady, in 1878, near Ludlow; a third in the same place in 1892; and a fourth near Ross-on-Wye in 1910. Since 1923 another seven specimens have been discovered in beech woods in Oxfordshire, the last some 20 years ago.

It is not only a very rare plant but also a very strange one. Having no green colouring matter, it cannot make its own food in the usual way. It is a saprophyte, existing for years and entirely underground as a whitish or brownish coral-like mass, rootless and absorbing nourishment only through a fungus which infects it. A flower spike begins to form about 10 years after the establishment of a new plant, and after an unknown lapse of years, perhaps another 10, it rises, leafless, a few inches above the ground and produces a (typical) orchid, about half an inch across, with a pink lip and yellowish petals. It is rarely fertilized. It is believed that much continuous rain is necessary for the coral root to flower; and to any botanist so rich a crop as 13 must be ample compensation for a wet summer.

—Submitted by E. L. FORSTER.

PRAHRAN JUNIOR FIELD NATURALISTS CLUB

About 70 persons, including several members of the Senior Club, attended the meeting of the Prahran Juniors on December 15, 1953. It was announced that at the February meeting there would be an election of office-bearers for 1954, comprising a President, Secretary, and three others. Miss Ina Watson was the speaker for the evening, and, with an excellent series of Kodachrome slides, she took the Juniors on an educational tour to Alice Springs, Ayers Rock, Mount Olga and other Central Australian places of interest. Several children spoke on their exhibits, and Mr. A. A. Baker showed a series of economically important Victorian minerals. The next meeting will be held at the Prahran Children's Library, Greville Street, on February 16, at 7.30 p.m., and members of the F.N.C.V. are invited to take an active interest in this new Junior Club.

—N. A. WAKEFIELD.

WHAT, WHERE AND WHEN

Saturday, February 20—Botany Group excursion to Mr. B. Schubert's plant nursery, Harristfield, where Mr. Schubert will demonstrate methods of propagating native plants. Take 1.35 p.m. Dandenong train, alight at Noble Park, then three-quarter mile walk. Mr. Brooks will meet party at station.

Saturday, March 6—Geology Group excursion. Details at Group Meeting.

Group Fixtures:

Tuesday, March 2—Geology Group Meeting. Meet at Russell Street entrance of National Museum at 7.30 p.m.

KENNETH W. ATKINS, Excursion Secretary.

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PROCEEDINGS

Mr. A. A. Baker presided over a meeting of about 150 members and friends at the National Herbarium on February 8, 1954.

First, an Extraordinary General Meeting approved the application for affiliation with the Club of the Ararat Field Naturalists Club, which has 21 financial members.

At the opening of the General Meeting the President welcomed several visitors, including two from England. Welcome was extended to Mr. Gabriel, who is back with the Club after his recent illness, and to Dr. Geroe, who is back from England.

The deaths were announced of Mrs. Walter Hanks and Mr. Semens, and those present stood in silence as a mark of respect.

Miss Midgley and Messrs. Houghton and Fink were elected as Ordinary Members, and Mr. Addison as a Junior Member.

The speaker for the evening, Mr. Ian Wallace, gave an interesting talk on the subject of snakes and showed a very good film including some close shots of their feeding habits.

The President announced the award of the Natural History Medallion to Mr. Charles Barrett, Honorary Member of the F.N.C.V. and outstanding worker in Club affairs for many years.

[Nature notes and exhibits, as well as other reports, are to appear in April *Naturalist*.]

WHAT, WHERE AND WHEN

Sunday, March 21—Botany Group Excursion to Fishermen's Bend. Take M.M.T.B. bus, Garden City, via Port Melbourne, in Flinders Street; meet at terminus, 2 p.m.

Sunday, March 28—Yering Gorge, nine-mile walk. Subject: Geology. Leader: Mr. W. Burston. Take 9.10 a.m. Healesville train from Flinders Street; alight at Yarra Glen. Bring two meals.

Saturday, April 10—Geology Group Excursion to Arthur's Seat. Leader: Mr. A. Cobbett. Take 9.10 a.m. Frankston train (does not stop certain stations), then bus to Dromana. Bring two meals. Fares, total cost approximately 12/-.

Group Fixtures:

Tuesday, April 6—Geology Group Meeting. Meet at Russell Street entrance National Museum at 7.30 p.m.

Native Plants Preservation Society:

Wednesday, March 24—"Bushland Flowers of Victoria", a selection of Kodachrome slides, by Mr. J. H. Willis. School Hall, M.C.E.G.S.S. Anderson Street, South Yarra, at 8 p.m. Tickets 2/-, from Miss Elder or Miss Waddell.

Prahran Junior Club:

Tuesday, March 16—Monthly Meeting in Children's Library, Greville Street, Prahran, at 7.30 p.m. Subject for evening: Volcanoes, by Mr. A. A. Baker.

EDITORIAL

The F.N.C.V. Council acknowledges with gratitude the grant made by the M. A. Ingram Trust for the production of this issue of the *Victorian Naturalist*. The Trustees undertook to finance an issue devoted to articles dealing with the origin, habits, food or life histories of Australian mammals.

The articles in the following pages piece together a story of the disastrous repercussions that civilization of this country has produced on the marsupial fauna of Victoria; but here and there a heartening note is struck by the stories of the halting, at least temporarily, of the tragic march to extinction. The story of the origin of our Australian fauna is being compiled gradually by the palaeontologist and geologist from the fossil records which are preserved in the rocks.

The Council thanks those who have contributed articles, photographs and illustrations for this special issue.

AUSTRALIA'S BANDICOOTS

By TARBTON RAYMENT, F.R.Z.S.

Many Australians are surprised to learn that they have no original claim to the name "Bandicoot", for it has been appropriated from the Telugu tongue, the language of the people of the eastern Deccan Plateau in India. There it is applied to a large rat, *Mus giganteus*, which is hunted for food, the title meaning, literally, "pig-rat".

It would have shown more character to have retained the melodious aboriginal names for our native animals. Are not "Urpile", "Wilalya", "Marl" and "Bilby" more euphonious than "Bandicoot"? Faced with the misnomer, one appreciates better the exactness of scientific nomenclature, for by it we know with which animals we are dealing.

The Bandicoot Family, PERAMELIDAE, is distinguished by its members having many incisor teeth (polyprotodont dentition) as in the carnivorous marsupials, but also two combined (syndactylous) toes as in herbivorous groups. The whole family comprises seven genera, but only a small number of species, about fifteen of which occur in Australia.

Actually, the main toe of the foot of a bandicoot is not a super development of the "big" toe, which is in fact almost obsolete, but is the fourth toe. The second and third toes are the small conjoined ones which function as a single unit. Over 100 years ago, Sir Richard Owen observed that these syndactylous toes were a highly specialized structure functioning as a hair-comb, for the animals' furry coats usually harbour a number of small parasites.

The Bandicoot is, of course, a marsupial, for it possesses a pouch or marsupium. However, much more than that external feature is connoted by the term, for it involves some amazing anatomical phenomena. To appreciate this, it is necessary to consider the reproductive anatomy of several animals. In the case of the Echidna, there are two distinct tubes, the uteri, which remain distinct, and the eggs may pass down either the right or the left, with a trend to the greater use of the left one. Two ovaries are present in insects, but a pigeon for instance has only the left ovary, while the European placental mammals have a distinctive bicornate uterus. The pouch of the Echidna is small and rudimentary and the single egg is developed there, but how it arrives there is as yet an unsolved problem.

In the case of the Bandicoot, there are at first two ducts, yet, later, two enlargements of the uterus press together and actually rupture and then almost immediately coalesce so as to form one pseudo-uterus in which the

embryo is developed. The temporary phenomenon has to be repeated at each pregnancy. The pouch or marsupium is well-developed, opening down and backwards and containing eight mammae with teats, from which the young mammals draw their sustenance. Wood-Jones (1943) uses the definition, "A marsupial is a mammal whose kidney ducts lie mesial to its oviducts", for this anatomical structure governs all the other phenomena.

The Pig-footed Bandicoot, *Chaeropus ecaudatus*, is our sole species of its genus, and it is so named because it has only two toes fully developed on each of its forefeet. This animal is brownish in colour and the tail is inclined to be bushy on the apical half. Its habitat was originally over most of inland Australia, but it is now quite rare.

The Rabbit Bandicoots are separated in the genus *Macrotis*, having very large ears and tufted tails usually white-tipped and conspicuous. The White-tailed Bandicoot, *M. leucura*, of Central Australia, is fawn-coloured on the back and has white limbs. "Urpile" is the aboriginal name for a darker race of the species, found further to the north. The commoner Rabbit Bandicoot, *M. lagotis*, is the aboriginal "Bilby", and it once inhabited the southern half of Australia; but it was reported to be extinct in Victoria as early as 1866. It has long soft fur, fawn-coloured above and white beneath. The aborigines like its sweet flesh and sought its bushy tail, too, for ornament and personal decoration.

The genus *Perameles* is distinguished by its members having very long tapered snouts and large pointed ears. It includes the Striped or Barred Bandicoots, and to one of these, *P. myosura*, of south-western Australia, the aborigines applied the name "Marl". The Eastern Barred-Bandicoot, *P. fasciata*, frequents the tufty grasslands of the western plains of Victoria and New South Wales. It has four stripes of darker hair on the hindquarters and its fur is softer than that of other eastern species. *P. gunni* of Tasmania is greyish-brown above and yellowish-white beneath, the tail is small and short and the fur softer. There is the "Little Marl", *P. bougainville*, of the Shark Bay country of Western Australia; and in the "Centre", the Desert Bandicoot, *P. eremiana*, is keenly hunted by the aborigines. The second Victorian species, the Long-nosed Bandicoot, *P. nasuta*, is very large and is not banded.

Members of the genus *Isodon* are called "Short-nosed Bandicoots", and they have short rounded ears. The common species, *I. obesulus*, is found throughout Australia and in Tasmania, too. Several islands near the mainland have their endemic forms; *I. barrowensis* comes from the West Australian Barrow Islands, and Nuyts Archipelago off South Australia has *I. nuytensis*. In northern Australia there are a further three species of the genus, a large stout species, *I. macrourus*, with coarse spinous hair and short ears, a second, the Golden Bandicoot, *I. auratus*, of a rich golden-brown colour with a pencilling of black, and also the Cape York species, *I. peninsularis*.

The sole representative of a fifth genus has been recorded from the extreme north. It is *Echymipera rufescens australis*, a sub-species, separated by Dr. Tate, of a New Guinea species.

In the early days of settlement, Bandicoots were exceedingly plentiful in the densely wooded hills of Gippsland. Many of the small clearings were devoted to the cultivation of potatoes, which do so well in the rich red volcanic soils. The Bandicoot is said to have added the tubers to its menu, hence the saying, "bandicoot the potatoes", but Crosbie Morrison (1946) says he could not tempt his tame bandicoots to eat potatoes.

The Bandicoot's omnivorous diet is indicated by its dentition, with the molars intermediate in structure between the low-crowned ones of the insectivores such as the Pigmy Glider, and the sharper ones of the herbivores such as the Kangaroo. Bandicoots have been observed to eat many kinds of roots and bulbs, fungi, small birds, earthworms, seeds of many species, and insects of several families.

My first acquaintance with the common Short-nosed or Coast Bandicoot was in South Gippsland, when I picked up a long slender grey foot, still warm, which had been chopped off by the jaws of a rabbit trap. The unfortunate animal had escaped, leaving the foot behind. The accident provided me with my first opportunity to study the anatomy of the syndactylous toes.

However, in later years many bandicoots were to come into my hands, and at Black Rock near my home, I am able to study them in their native haunts. Here the Short-nosed species still manages to survive, though new houses are closing in about the little animals, and they must soon disappear from that once picturesque area, which might well have been reserved as a sanctuary for the Bandicoot, and the unique Sandringham flora.

The animals are timid and shy, creeping furtively amongst the undergrowth, so that the novice would at first mistake one for a large rat. The nests are usually formed of leaves and grass, built up in a low dome-like structure over a shallow depression in the ground, often under a Coast Wattle or a Black Shoke. An entrance is provided at the side but the whole structure is so beautifully camouflaged as to easily escape the casual eye. The nest rarely exceeds a foot in diameter, and is only a trifle higher than the level of the ground.

They come out to feed mostly at night-time, and when startled they make a soft emitting sound, but whether or not that indicates fear has yet to be determined. It may be just a matter of surprise, or even warning.

The Bandicoot breeds frequently in captivity, though at somewhat irregular intervals. Up to four and five young have been reported at a birth, though two is the usual number. Many naturalists have made pets of them, but if confined too closely, they will kill their young and fight to the death amongst themselves. So long as their run is extensive, with a dense shelter of shrubs and bushes, the animals will do well, for even in their wild state they seldom wander far from their own particular locality. When unused to being handled, they become very excited and have been known to inflict a scratch with the largest toe, or even a bite, on an outstretched hand.

Though mainly nocturnal, I have seen them foraging about at Black Rock in broad daylight. They will eat toast and biscuits and pick scraps of meat from bones discarded from the table. There is no doubt whatever about their omnivorous appetite.

Bandicoots play an important role in the life of the Australian aborigine, for the animals are keenly hunted to provide a tasty meal. The cooking of them is often of the simplest nature: after being encased in thick mud, the Bandicoot is placed among hot embers, and roasted *a la casserole*. When judged to be cooked, the caked mud is cracked off, carrying the fur with it; the entire viscera being then removed from the interior as a hard lump to be discarded. Sometimes the dead game is simply roasted over an open fire.

The animal also plays a not insignificant role in the white man's economy, although the little marsupial seldom receives credit for its good work. Bandicoots eat very large numbers of destructive insects, and should be conserved if only because of that appetite. They are amongst the most harmless of creatures. Surely we Australians should have enough pride in our native land to protect these most interesting marsupials.

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PLATE X



PLATE XI



Characteristic pose of mother Koala and cub.
In another six weeks or so, the baby will be independent of its mother.



Koalas on French Island.
A group gathered in readiness for boxing up.

THE REHABILITATION OF THE KOALA IN VICTORIA

By F. LEWIS

Investigations which I have made over the past forty years, clearly indicate that in the early days of this State koalas were exceedingly numerous, their habitat extending from the Glenelg Valley in the extreme west to Mallacoota in the extreme east. They were also abundant in many parts of the north-east, notably so around Strathgogie, and in the Goulburn Valley. But Gippsland, both North and South, seems to have had the largest population. Although they were found all round Western Port, it would appear that none was indigenous to any of the islands in that bay—French, Quail, and Phillip Islands—although the food trees which they favour were in great abundance there.

Early residents of South Gippsland have informed me that before the advent of the railway, which resulted in the opening up and clearing of the country, most of the land was covered with heavy forest. Because of the absence of fires there was little scrub and one could easily ride through the forest. The Manna Gum (*Eucalyptus viminalis*) was very common on the river flats and practically every tree contained one or more koalas. But with the coming of the railway the land was thrown open for settlement, trees were felled and the forests burned, with the result that, in a few years, the koalas had practically disappeared from that part of the country.

In other parts of the State, in the latter years of the nineteenth century, quite a number of koalas were shot for the sake of their skins. Three localities where old residents have told me of this occurring are Strathgogie, the hill country south of Warrigal, and also the northern slopes of the Strzelecki Range from Traralgon eastwards. The skins brought from sixpence to tenpence each and were eagerly sought. Doubtless there were many other districts where this kind of thing went on, because the administration of the game laws in those days was exceedingly lax. Platypuses were killed for their furs, and any animal or bird good to eat or which the settlers thought might be damaging their crops or grass was wantonly destroyed. It was mainly in this period that the Native Companion and the Bustard were so greatly reduced in numbers that when game laws were eventually enforced it was too late to save them.

Until the time of Federation the game laws of Victoria were administered by the Department of Trade and Customs. There was, however, no special staff to deal with game conservation, nor were there any game wardens or inspectors. After Federation, game law enforcement was handed over to the Ports and Harbours Branch, first of the Department of Agriculture, and later of the Public Works Department, then ultimately to the Chief Secretary's Department. It seems a pity that it was ever removed from the Department of Agriculture, which is a much better organization to deal with fauna conservation than a department concerned with such things as the control of racing and the care of neglected children, prisoners, and asylums for the mentally ill.

The Ports and Harbours Branch had a miscellaneous lot of duties to perform, fauna protection being only one of them, but ultimately one permanent inspector was appointed. Considering that he had to look after amateur and commercial fisheries as well, it is not difficult to realize how little time could be devoted to the fauna side of the work. But in 1910 a big step forward was made. A Parliamentary Royal Commission recommended that Fisheries and Game be removed from Ports and Harbours and made a separate branch with a staff of outside inspectors to enforce the law. The Government approved and the branch was set up to administer Fisheries and Game from July 1, 1910. Although the staff, both indoor and outdoor, was small, such activities as shooting koalas for furs ceased entirely. Actually this had practically come to an end some years previously, owing to the increasing scarcity of these animals.

In the early 1920s, when in charge of the department, I became very concerned at the state of affairs. Inquiries were instituted to determine where and in what numbers koalas still existed. It appeared that they had gone entirely from western Victoria, the Goulburn Valley and the north-east, and that only in a few places in Gippsland did any remain.

To ascertain the exact position, I investigated Gippsland from Dandenong to Yarram, all through the hill country of the Strzelecki Ranges where once these animals lived in their thousands. Schools were visited and scholars questioned as to how many had seen koalas; milk and cream carters were interviewed, in fact anyone who had a knowledge of the country was sought. The net result was that, although an odd few animals were found, it was definitely proved that only two small colonies existed, one near Yarram and the other between Grantville and Corinella.

Investigation of the three islands in Western Port was then undertaken. As already stated, koalas were not indigenous to any of these. It appears that a few were first taken to Phillip Island in 1870 by a Mr. J. F. Smith, from the Bass River. Later, Mr. W. Kennon obtained some from Flinders, and Mr. Graden some from Gippsland; but it was not until many years later, when Mr. W. Thompson of Cowes brought a good many from French Island, that the population really began to increase.

As regards French Island, some fishermen of Corinella informed me that they took the first koalas there in the 1880s. They did not increase to any great extent, however, for many years. Koalas normally have only one young at a birth and they do not breed every year, so that increase is naturally slow. Quail Island was first stocked in 1934.

On all these islands, the koalas' favourite trees existed in great numbers. On French Island, it was mainly the Manna Gum (*E. viminalis*) that was eaten. On Phillip Island, the Manna Gum, the Swamp Gum (*E. ovata*) and a form of the Blue Gum (*E. bicostata*) were all favoured, while on Quail Island, Manna Gum, Swamp Gum and to a certain extent the Common Peppermint (*E. radiata*) were eaten.

Seeing that there was abundant food on all these islands, it was considered that with care and close protection, sufficient numbers of koalas could be built up from which to stock other suitable areas on the mainland. Phillip Island is nowadays the only source of supply, but French and Quail Islands have both been utilized in the past. But to get koalas from these two latter boats were required, and that added to the cost and increased the length of time the animals were on their journey.

Quail Island, an area of Crown land of 3,000 acres, was at one time heavily timbered, mostly with Manna Gum, and after stocking in 1934 the animals did so well that in the autumn of 1944 about 1,500 strong healthy animals were transferred to other districts. Examination of Quail Island in subsequent years showed that it is badly infested with insect pests of many kinds and the trees are now in a bad state. It might be worth considering burning over the whole of the island on some suitable day, with adequate safeguards, to destroy the millions of pests which afflict the trees there. Such a fire would bring to life the eucalypt seeds lying in the ground, and in a few years there would be a luxuriant growth of healthy trees.

French Island is also of no further use as a source of supply, principally because the timber on the island has declined seriously in recent years, due to fires and insect infestation. One has only to look at French Island from Tankerton to see thousands of dead trees which at one time supported a large koala population. While the animals are still found there, they are not sufficiently numerous to justify the trouble and expense of going for a consignment.

Phillip Island, too, is rapidly losing its timber. Large quantities are cut for firewood, for drying the chicory which is so largely grown on the island, and more land is being cleared every year for cultivation. There are two

small reserves on the island, which are being planted with suitable food trees, and I anticipate that in the not very distant future these areas and the stretches along the roadways will be the only timbered places on the island. If the people of Phillip Island realized what an attraction to tourists the koalas are, they would in their own interests do something to preserve the trees, but the number of people interested in the matter is woefully few.

Areas to be restocked were carefully chosen. A prime necessity was, of course, a bountiful supply of the natural food trees of the koala, which as most people know is a food faddist of the highest order. I have seen two Manna Gums growing in close proximity on Phillip Island, the leaves of one being eaten while the other tree was left completely alone. To me, the leaves were identical in growth, flavour and texture, but the animals detected some difference which made the leaves of one acceptable and those of the other not.

Another essential factor in the choice of sites for restocking was the relative safety from fire. Although some people blame hunting and shooting or disease for the disappearance of the koala from the Victorian bush in the last forty or fifty years, I am firmly convinced that the bushfire was more than anything else responsible for this state of affairs. Each summer, in spite of every care on the part of Forestry officials and others, thousands of acres of our countryside are ravaged by fire. In much of this country koalas once lived, so while that goes on it would be foolish indeed to waste effort in liberating koalas in any locality where there is a chance of them being burnt out.

Another factor in choosing a site is to have some local organization which will take some interest in the welfare of the koalas and keep the department advised as to their progress.

Transfer operations should be undertaken either in the spring or autumn, the latter for preference. The reason for this choice is that a baby koala is usually born in March, being then only about half an inch in length. It spends about six months in the mother's pouch, coming out about September, when it is weaned; but it is still very much dependent on its mother and remains with her until about the end of the year. So if transfers are made in the spring it is possible that mother and cub may become separated and the baby lost. But in the autumn the young ones are well able to look after themselves. It is very unwise to attempt transfer operations during the summer months, as heavy losses may be incurred owing to the heat and the confinement in the boxes.

If possible, the whole operation of catching, transfer and liberation should be completed in the one day. If this is not possible, the animals are taken to some central depot and given a meal and a spell out of the boxes for the night. By these methods a consignment usually gets through in excellent condition, and, over the years, the losses in transit have been almost nil.

The methods employed to catch and transfer the koalas are now more or less standardized. The work involves the services of at least six men, whilst a number of corn sacks and suitably prepared boxes, a truck, and sometimes a boat, are required. Living in the trees as they do, the animals are not easily caught, and some of us know to our cost that when interfered with they do not hesitate to use their teeth and strong sharp claws.

The men locate a suitable area of timbered country where the animals are reasonably numerous. One man has a long pole with a strong but light rope attached, at the end of which is a running noose. If the tree in which an animal is located is not too high, it may be possible to reach up, put the loop round the koala's body, and by gently pulling persuade it to come down. If it refuses, a tarpaulin is held under the tree by four men, and the animal is pulled off the branch and caught as it falls. It is then lifted from the tarpaulin and placed in a cornsack which is tied at the mouth and suitably ventilated. This is left in a shady spot while others are collected. They are then con-

veyed on the men's backs to be placed in the boxes on the truck on the road, each with a good supply of gum-leaves, and so to their destination.

One ideal site that was stocked a few years ago is Mount Alexander, a few miles from Castlemaine. Here is a magnificent State forest of several thousand acres of Mauna Gum, reasonably safe from fire, and with the Castlemaine people very interested in the project. There the koalas have done very well, and spread over a large tract of country.

This policy was commenced in the early 1930s, all three islands in Western Port being used as reservoirs, as circumstances warranted, for stocking other places; and some thousands of koalas have now been transplanted back to safe homes where once they existed but from which they have been absent for many years.

From an estimated total population of about 500 in 1925, they have now increased to many thousands in this State and their future safety seems assured. While this work was going on, the public was being educated to a koala conservation consciousness, so that nowadays it is unlikely that anyone would dream of destroying or even molesting one of these lovable little creatures.

BOYHOOD MEMORIES OF THE MITCHELL RIVER FAUNA

By H. R. WAKEFIELD, Melbourne

As a schoolboy I saw the decline or disappearance of many native animals from the vicinity of the Mitchell River near Lindenow, and, as the dates of some of these happenings can be fixed within a year or so, they may be of use as well as interest to naturalists. In those days, nature study was not fostered in schools, and we had no reference books to supply information about what we saw. Our activities did not bring us into contact with many purely nocturnal animals, so that in those days I did not see any of the Glider Possums for instance, though local folk often referred to the "flying squirrels".

There is no doubt that, before the earliest settlers arrived, the greatest concentration of native animals was about the river flats themselves. For this reason the aborigines also favoured these tracts, and the original settlers often treated both man and animal with the same ruthlessness. In one place, above Lindenow, a huge pit had been dug, and kangaroo drives were conducted periodically. Scores at a time would be herded between long wing fences, in the shape of a V, and forced to jump over a low barricade at the end—into the pit. Traces of the trap could be seen until quite recently, though the "need" for it disappeared perhaps seventy years ago.

We went to live at "Horseshoe Bend" on the river flats adjacent to Hillsdale late in 1900 and left there a little over a year later. At that time, both black and grey wallabies were on the more wooded north side of the river and would often cross over when the water was low, always on all fours, to feel the depth as they went. It was in about 1904 that I last knew of a wallaby coming down to the river there. It was a stray and had wandered through about half a mile of maize. However, though disappearing completely from that part of the flats, both kangaroos and wallabies persisted in large numbers on adjacent forested slopes.

The limestone bluff overlooking the river here was fairly honeycombed with wombat burrows, and these animals used to cross the river at night, roll down several sets of maize each and eat a few cobs. As this performance would be repeated each night there was trouble with the farmers, who found the raiders very difficult to deal with.

The flats were not all cleared at that time and there was plenty of shelter for wild animals. Native Cats were particularly numerous, and liked hen eggs and young chickens. They regularly raided our kitchen also, getting at the flour-bag or any bread or such that they could find. I remember my father taking me duck shooting with him, and we hid in tall reeds bordering

PLATE XII



ROBERT T. LEWIS

Koalas about to be liberated on Quail Island.



Looking round the new home on Quail Island.

PLATE XIII



Koalas at Mout Alexander near Castlemaine.
When first liberated, they make for the nearest tree; then within a few
hours they spread out to suitable food trees.

a small lagoon. Logs had been rolled into the lagoon during clearing operations, and presently the whole place seemed to become alive with Native Cats. At least twenty could be seen at one time in the bright moonlight, scampering and chasing up and down the logs and rustling through the reeds.

This was just one tiny corner of the "cat" domain, and shows what their numbers must have been. About a year later, probably in 1902, I remember seeing our Native Cat on a moonlight night, and since then have not seen another in its wild state. I have since learned that this disappearance was widespread.

Late in 1901 we moved to Flaggy Creek, on the opposite side of the flats from Lindenow, and it was there and at that time that we came by the most interesting little animal that we ever had as a pet. My two brothers and I were with our father, who was building a pig paddock (with upright split slabs) on a scrubby, partly forested hill-side. We heard our dog barking as she chased something through the ferns, and presently a Rat-Kangaroo, hard pressed, passed quite close to us. The dog was almost upon her when she plucked a young one from her pouch and threw it away out of the path of the dog. It rolled over and over and brought up right at our feet and we picked it up. Relieved of her burden the kangaroo quickly lost the dog. We have since wondered how long she searched afterwards for her baby.

It soon learnt to take milk from a spoon and was tame almost from the first. As it grew up it became very fond of bread soaked in milk and sugar, and it also used to nibble at tender pieces of grass and other vegetation. It did most of its eating in the kitchen, holding its food in both "hands" and constantly hopping to the door to see where the dog was. They never made friends, though it was quite evident that the dog would not molest it. If the dog were near, it kept up an excited chattering. Its bed was a short length of a small hollow log, lined with a possum skin, and kept in a corner of the kitchen near the fireplace. After half a century one still remembers with affection this lovable little creature.

We also made pets of possums, both Silver-grey and Ringtail. The latter could be obtained from their nests in the willow trees along the river, and the Silver-greys from the pouches of their mothers which had been trapped. Rarely did one find either at just the right age; if too young, they could not survive without their mothers, and if too old, they were not to be caught. They made affectionate pets; too much so at times, as they had a predilection for our hair. In their endeavours to scramble up to make themselves snug on the tops of our heads, our faces were often scratched.

Possum snaring was quite an industry when we were at Flaggy Creek. I have often visited trappers' camps, to bring home carcasses for the pigs. There was often a heap of Silver-greys piled three feet high from one night's catch. Within a few years they became so scarce along the Mitchell Valley that it seemed they would disappear in the path of settlement. This has not proved to be the case, for the Silver-grey is now in many settled districts and towns in very great numbers. It has developed a taste for fruit and cultivated shrubs, and so has become quite a pest in many places.

Only once did I see a Tiger Cat. Our dog, a rather stocky one with a predominance of Collie blood, flushed it from a half-rotted log covered with brambles, tall bracken and shrubs. The battle was fierce, both cat and dog suffering damage, but the cat escaped. This was on the side of the bluff overlooking the Horseshoe Bend, and happened about two years after the disappearance of the Native Cats.

I saw only two koalas during all the time I was in that district, one in 1902, along the back road to Bairnsdale, and the other in 1910, on Mount Lookout. Being mainly nocturnal, bandicoots and marsupial mice were seldom seen, though the burrowings of the former indicated their abundance. Finally, with mention of the Echidna and the Platypus, I can conclude my boyhood memories of the marsupials of the Mitchell River.

THE REDISCOVERY OF THE ROCK-WALLABY IN VICTORIA

By N. A. WAKEFIELD

Though many marsupial groups have representatives in Tasmania or New Guinea, the Rock-Wallabies are wholly Australian, being confined to the mainland and a few of the small islands close to the coast. In Ellis Troughton's popular book, *Furred Animals of Australia*, eleven species are listed, ten belonging to the genus *Petrogale* and one, a much smaller animal, to *Peradorcas*. It is with the occurrence in Victoria of the Brush-tailed Rock Wallaby, *Petrogale penicillata*, that this article is concerned.

This species is stated to have ranged as far north as the Liverpool Ranges in New South Wales, while in Victoria it was formerly abundant in the rugged mountain country of north-eastern Gippsland, particularly in the parts overlooking the Snowy River and about its western tributaries, the Buchan, Murrindal, Little and Suggan Buggan Rivers. It is reported to have lived in the vicinity of Omco, near Livingstone Creek and at Mount Tambo, but further records to fix the limits of its occurrence in Victoria are not forthcoming.

As with many other marsupials, our Rock-Wallaby declined rapidly in numbers from about fifty years ago, until finally, by about 1916, it was regarded as extinct in Victoria, not only by zoologists but by the local residents who were familiar with its original haunts. This was the state of affairs for just over twenty years until, in about 1937 or 1938, it was seen again by two of the present country members of the Field Naturalists Club of Victoria, Mr. Keith Rogers, of "Rockbank", Wulgulmerang, and Mr. Clyde Sykes, of "Karinya", Gelantipy.

In a letter dated September 2, 1953, Mr. Rogers gives the following account of his experiences with the animals: "When we came to live at Black Mountain I was a child of seven, that being in February 1903. We used to go for rambles round the cliffs on Mount Hamilton, and the Rock-Wallabies were extremely numerous. Any cracks and ledges or small caverns were worn smooth and shining by the wallabies that lived in them. Being fearless and also most inquisitive, they would bound onto the highest rocks and look down on us. As I became older and rambled further, there always seemed to be these little wallabies wherever there were cliffs, along the whole Suggan Buggan divide. Just about then, and perhaps for another year or two, great numbers were shot for their skins. I have been told that, one winter, a party shot 1,200 in Suggan Buggan.

"My first ride to the Snowy River, at McKellar's Crossing, was in about 1905 or 1906, when my father took a horse to exchange at the ferry with the then occupier of Tuhhut. With us was John Flynn (later of Inland fame), who was a student in the Presbyterian Church. He was an excellent photographer, and I remember Mr. Flynn taking photographs of the Rock-Wallabies that swarmed on the high cliffs about Tangham's Bluff on the old road—that is, on the first part of the cutting on the fall for the Snowy.

"They being so common, and we so accustomed to seeing them, I cannot say just when they began to become scarce. Also, being a child at that time, I would not know how widely they were distributed beyond this district. However, they were most numerous on the Suggan Buggan and Snowy falls, wherever there are cliffs, and that is almost everywhere! I am told that they were numerous about Murrindal and Buchan, too. They preferred the sweet country such as where the box grows. They would run up the box trees to feed, and also the kurrajong, of which they were very fond.

"From what I can remember it would appear that the wallabies began to decline in numbers very rapidly from about 1906 or 1907, and well before the first war they had practically disappeared. It is generally thought amongst the locals that shooting reduced the numbers, but that the foxes really killed

them out, as with many other animals. In 1915, when riding all our mountains when mustering, the only places where I saw Rock-Wallabies were on the Buchan River at a gorge about ten miles west of here and at the Lighthouse on the Suggan Buggan River. They were the last I saw anywhere until I saw those at the Wallaby Rocks some fifteen or sixteen years ago.

"Unfortunately, I cannot be sure of the exact year or date of this find. On that occasion I was boundary riding the fence of the eastern paddock, when, to my amazement, I saw a Rock-Wallaby jump onto a rock and peer down just as they always used to. Shortly after this I mentioned the fact to Clyde Sykes and he saw them when up after dingoes, and through that channel the Museum heard of the find.

"Last year I went and searched the Lighthouse for wallaby tracks, but there are none there now."

Mr. Sykes has a very sound knowledge of the native animals and their haunts; through experience during the execution of his one-time duties in connection with the trapping of dingoes over the Snowy River country with which we are concerned. He reports that, on learning from Mr. Rogers that a Rock-Wallaby had been seen, he examined the area and observed several of the animals. At one stage there were four in sight, moving about and at times playfully cuffing each other. On becoming aware of the intruder, these gave the usual warning thump and quietly slipped into cover.

The area of this original discovery came to be known as the "Wallaby Rocks". They are at an elevation of about 2,800 feet—a steep scrub-covered outcrop just below the top of the scarp of the Wulgulmerang Plateau. The aspect is north-easterly and a fine panoramic view is obtained across the valley of the Suggan Buggan River which is five miles away and 2,000 feet below. The rocks are granitic and extend about a mile to a great bare crag known as the Hanging Rock. Mr. Rogers later examined the outcrop and found indications of the wallabies being here and there over the whole extent of it.

Mr. Sykes recounts that, on the occasion of one visit to the Wallaby Rocks by Museum personnel, he



Locality Plan: The three known colonies of Rock-Wallabies are indicated and numbered

worked through the area well below the upper part, and observed altogether about twelve of the Rock-Wallabies as they moved down the slope away from the higher rocks. One specimen was shot, and officially identified by Mr. C. W. Brazenor, mammalogist at the National Museum of Victoria, who published a brief record of the matter in October, 1947. (*Mem. Nat. Mus. Vic.* No. 15, p. 154.)

On January 30, 1949, Mr. Rogers and his son took the present writer to the Wallaby Rocks. It was towards evening and the slope was in deep shadow. The area was approached along the boundary fence, and the conspicuous rock, where the original animal had been seen, was examined first. The members of the party moved down and spent some time lying quietly on a huge rock lower down, and from time to time tossed stones into the scrub down the slope in an endeavour to excite the normal curiosity of the little animals and bring them out to be viewed. Just when these efforts were deemed fruitless and it was decided to return, a fine specimen was seen calmly gazing down upon the party from the top of the original rock about fifty feet away. It remained in full view for a considerable time until a move was made towards it. Then it slipped silently over the edge and disappeared, but was flushed out again later at very close quarters.

The Brush-tailed Rock-Wallaby is stockily built, the general colour is a rather dark reddish-brown merging to black on the feet, tail and sides of the face. It is a handsome animal, large as Rock-Wallabies go, and the name of the species refers to the long hair which clothes the full length of its tail.

To Mr. W. B. Hitchcock, ornithologist of the National Museum, belongs the credit of discovering another colony of Rock-Wallabies, about five miles to the north of the Wallaby Rocks, below the chasm cut by Stradbroke Creek as it comes over the escarpment of the plateau before falling steeply to the Suggan Buggan River. Mr. Hitchcock tells how, on July 20, 1953, he made his way from Suggan Buggan to Mount Stradbroke, under which this conspicuous chasm has been cut. While negotiating the rather tricky descent of the cliffs a few chains to the east of the lower end of the gorge, he rounded a point of rocks and came upon three Rock-Wallabies on a rather large broad rock-ledge. Two of them immediately disappeared amongst the neighbouring scrub-covered rocks, but the third remained a while before giving the usual "thump, thump" and following the others. It was evident that the animals had spent some time scuffling about at this spot. The observer commented particularly on the ability of the sizable animals to move quite noiselessly through the rocks and scrub.

The writer paid a visit to the same spot on January 21, 1954, to make further observations. Before working round the mountainside to the gorge, two other rock outcrops were examined some distance to the south-east, and at each of these there were indications of the recent presence of Rock-Wallabies. It had been an extremely hot day, but thunderstorms developed in the afternoon and some time was spent sheltering from the rain, so the gorge was reached too late for a thorough exploration. However there was abundant evidence that it was the strongpoint of whatever wallabies there were in the area. A fleeting glimpse was obtained of one as it disappeared over the edge of its look-out rock, and a little stalking was rewarded by a further sighting of the same animal. It was on a rocky slope, and after giving a triple "thump, thump, thump", it slipped off in the usual noiseless fashion through the dense scrub.

The divide here between the Suggan Buggan and the Little River is known as Rocky Range. It is of the same granitic formation as the Wallaby Rocks, and where the wallabies occur is on the more broken scrub-covered outcrops rather than the higher cliffs and precipices.

As regards the Rock-Wallabies which were found formerly along the Mur-

PLATE XIV



Brushtail Rock Wallabies high up in trees

These photographs were taken many years ago, when the animals were abundant in the Snowy River district. The facial markings and the bushy tail are well displayed in the specimen in the right hand picture.

PLATE XV



Wallaby Rocks. Summit Hill in background with the Flamingo Rock.



Close-up of some of the Wallaby Rocks.

It was on the top of the pinnacle on the right that Mr. Keith Rogers saw the Rock-Wallaby in about 1937 or 1938.

PLATE XVI



Hazel on the Buck Wallaby

The video is very quiet from September and early from January as well as a feeding video down the Snowy River gorge.



Rick Wallaby's track

Here one animal investigated beneath a large rock mass. After rounding the close rock it took off onto a nearby building.

PLATE XVII



Strallevie Creek Cañon

This is the steepest part of the Rock-Wallabies which survive on the Rocky Range at Sugarloaf Mountain.



Snowy River Gorge

Rock-Wallabies inhabit the rugged slopes seen in the foreground and the middle distance.

rindal River, another country member of the F.N.C.V., Mr. Leo Hodge, of "Poorinda", W. Tree, made the following observations in a letter dated September 11, 1953:

"In this locality there used to be Rock-Wallabies in all cliffs of any size up until about 1914, but from then on their numbers became less each year and they finally disappeared about 1917-18. I think the rabbit, which increased to plague proportions about that time, was the main cause, as grass was probably the wallabies' main food, although I remember that they used to eat *Pomaderris* and *Correa* too.

"Just to watch the wallabies leap, we would frighten them out of their homes in the rocks with long sticks, and sometimes there would be three or four in one place. It was usual to see them jump forty feet or more down the side of a cliff, touch a jutting point of rock, and turn to the side even at right-angles.

"Up until 1910-11 the Koala was quite numerous, but it disappeared in about 1916, much the same as did the Rock-Wallaby."

On August 31, 1952, there came to light evidence that the Brush-tailed Rock-Wallaby still survived also in this southern extremity of its former range. This discovery was made in the Snowy River gorge east of Butchers Ridge, and just twenty miles in a direct line from the Wallaby Rocks above Suggan Buggan. On this occasion, Mr. Hodge and the writer were engaged on a botanical exploration of this extremely interesting area.

To reach this particular gorge one takes a motor vehicle as far as the "Tulloch Ard" homestead, and then proceeds on foot down the very steep spurs to the Snowy. It is best to strike the river above the main gorge and then work downstream, rather than attempt to negotiate the more broken approaches lateral to the gorge.

Though no animal was seen, their droppings, which could not be mistaken for those of any other local animal, were seen here and there on the almost inaccessible ledges and pinnacles where only a Rock-Wallaby would venture. Furthermore, three perfect sets of prints, also unmistakable, were found where one of the animals had crossed a moist patch of sand left amongst the rocks by a recent flood.

Rock-Wallabies have broad pads on the soles of their feet, the whole length of which, from toe to heel, is applied flat to the surface upon which they leap. In the case of the common Swamp Wallaby and Brush Wallaby (known locally as the "Black" and "Red" respectively) one finds the deep prints of their large toes, for the heels (back-bending "knees") are held well clear of the ground as they leap along.

The writer made a second excursion into the same locality on January 20, 1954, again with Mr. Hodge, and a bivouac was made overnight. This time, about a mile of the extremely rugged terrain was examined along the west bank of the river, both low down and on the precipitous slopes several hundred feet above. There were abundant indications that the Rock-Wallabies frequented the whole of the area explored, though the oldness of the evidence in most places suggested that a comparatively small number of animals ranged widely over it, apparently according to food supply. Native grasses and other rush-like plants were observed to be cropped closely, particularly in the crevices of the rock outcrops.

The wallabies' habitually come down onto the sands of the river bank, though apparently not to drink, and in one place a wallaby had investigated a "cave" beneath one of the numerous huge boulders lying about. It is interesting to note that there were no prints to indicate that the front paws had been put to the ground, though the cave roof was so low that the wallaby must have had to almost creep along. However, it had progressed by means of a series of very short leaps, with the long brushy tail dragging along. This feature is probably universal with the Rock-Wallabies, providing an interest-

ing contrast to the well-known method by which the large wallabies and kangaroos progress when moving along slowly, supporting themselves by the tail and fore-paws while the hind limbs are moved forward. The tail of a Rock-Wallaby is not strong enough to be used in this fashion.

The overnight stay was for the purpose of observing the wallabies themselves, for it was considered that late evening and early morning would afford the best opportunity of so doing. But, though the cliffs near and far were examined from time to time with binoculars, none was seen. This was probably due to the very hot mid-summer weather, when the wallabies would be in the coolest and deepest caves and crevices. However, there had been activity among them during the night, for sets of tracks were observed on January 21 on one large sand-bank which had been bare the day before. This was well upstream, and observations had showed that under the huge walls a mile to the south others had been moving about very recently too.

Towards the northern end of the habitat of this colony there is a large cave, the mouth of which can be seen plainly from a mile away. Examination proved it to be a favourite roosting-place of the wallabies, two spots in it being worn smooth and shining by constant contact with their pads and furry bodies. From each of these places there was a clear view of the only negotiable approaches to the cave, so they must have been chosen for the sake of safety. From the cave one obtained also a fine panoramic view over the whole of the section of the river gorge and the cliffs which provide a home for this group of wallabies.

Except where the river has cut through to rather beautiful dark-blue Ordovician sedimentary rock, the cliffs and gorges along this section of the Snowy River are porphyry. In most places progress is difficult amongst the broken rock masses whilst here and there walls, some hundreds of feet in height, rise sheer from the water of the river. Even the agile Rock-Wallabies are unable to negotiate such places, and tracks are found where they make their way to higher terrain away from the river to avoid them.

Here the Snowy slips through the gorges at only about 100 feet above sea-level, but in a little over a mile either side the country rises to about 2,000 feet. The nature of the place may be gauged from the fact that large stacks of flood debris were found on cliff-ledges a hundred feet above the river, and twenty feet higher up there were some Red Gum trees which must have grown from seeds deposited there by a much higher flood many years ago.

Such is the type of country to which the Brush-tailed Rock-Wallaby has retreated before the advance of man and his alien fauna. We now know of three Victorian localities, in each of which a little community of a dozen or so of these wallabies live, and further searching will surely bring to light more such places, probably about the upper Buchan River and the lower reaches of the Little River. It seems that the animals have adjusted their numbers to the food supply which is available to them in places safe from their natural and introduced enemies, and that the possibility of bush-fires, too fierce to be avoided, is now the only threat to their survival.

Note.—While the foregoing account was in press, it was learned from Mr C. E. Bryant, of the R.A.O.C., that in 1923 he saw a number of Rock-Wallabies at the foot of the Snowy Bluff by the Moroka River not far from its confluence with the Wonnangatta. Some were seen towards evening, and later, in the moonlight, quite a number were scuttling about on the rock ledges.

This report not only extends the original known range of the animals in Victoria, but provides also a record of their occurrence at a time several years after they were thought to have disappeared. It would be interesting to know if the Rock-Wallabies still survive along the Moroka River after the lapse of over thirty years.

A WORD FOR THE DINGO

By LEO HEDGE, W Tree

As I am a sheep-owner, it may seem rather odd that I should give the Dingo any honour, but experience and observation of it over a number of years have taught me the injustice of condemning all because of a guilty few. However, it is credited with being Australia's most destructive and cruel animal, mainly in connection with the killing of sheep and sometimes calves. They are proclaimed vermin and there is a bounty for their skins. In spite of this I believe that something like five per cent only may be sheep killers.

Although domestic dogs are kept more or less under control, there have been, according to my experience in this district, more sheep killed by them than by dingoes. Were such dogs as our Border Collies given the same privileges as dingoes, that is, to inhabit the bush or to be left uncontrolled, I am certain that sheep-killing would reach alarming proportions.

Some of our best sheep dogs of to-day are said to have originated through crossing with the Dingo, but nothing has been done to domesticate and train the latter to be of some use. About thirty years ago I saw a dingo with a few sheep it was keeping together in a small flock, just as our sheep dogs do. There were no sheep being killed at the time nor for at least twelve months afterwards.

This incident led me to understand why the strongest and healthiest sheep are the victims when killers are at work. Sheep, if kept together by a dog and not permitted to travel in any direction, will finally break away, the strongest making the first rush. So a dingo, after rounding the sheep together, attacks and kills the first to break from the group.

Wallabies are their natural prey, and when hunting in a pack, the dingoes always go against the wind. Some travel along a gully or creek while the others are scattered on either side. The wallabies, when disturbed, flee downhill and are killed by the dogs waiting below. The old females are best at the latter task. Dingoes seldom "run" their prey.

Each dingo pack, consisting usually of male, female, and young up to eighteen months or two years of age, seems to keep to its own area. I have noticed this by trapping one pack out, then having to shift the traps to another locality to catch a second lot, and this may be only six or eight miles away, a very short distance for a dog.

The pups, not being cunning, are caught first, and sometimes it is eighteen months before the two old dogs are caught. Over the years I have trapped several such packs, and in no case did the old female show signs of having another litter of pups before the previous lot were able to fend for themselves. This means that, at least in this locality, individual dingoes do not breed each year, for pups twelve months old would not be able to catch and kill wallabies.

Whether dingoes mate for life I do not know, but I have noticed that the male remains with the female until their young are able to care for themselves, so it is quite likely that they do. These breeding cycles and the pack life seem necessary for the survival of the species.

Dingoes never bark, but if caught in a trap and while trying to escape they give a constant little "yap". To warn the pack of danger a dingo gives one long low howl, and to call another it usually utters three high-pitched howls.

Dingoes never trot as other dogs do, but to increase their pace from a walk they break into a lope. This was a feature of one of my best sheep dogs, for its sire had been a dingo.

I count the Dingo as one of our native Australians, and if they become extinct we shall lose a unique and beautiful animal.

THE SQUIRREL GLIDER

By DAVID FLEAY, West Burleigh, Queensland.

It can be claimed without much fear of contradiction that the prettiest faces, the softest fur and the sharpest teeth and claws of all Australian tree climbers belong to those vivacious little Glider-Possums which are commonly mis-called "flying squirrels". Neither is there real exaggeration in the statement that these exquisitely pretty creatures represent a high development in the Phalangerid family, for father Glider-Possum, in the genus *Petaurus* at least, is unlike most other marsupial males in actually assisting in the care of his offspring.

Rarely seen on account of its strictly nocturnal habits the Squirrel Glider, *Petaurus norfolcensis*, is the middling-sized member of the group ranging from Victoria, where it is rare, to regions north of Cardwell in Queensland.

Here at West Burleigh, some ten miles over the New South Wales border in sunny Queensland's South Coast area, the charming, clean-furred Squirrel Glider is our commonest tree mammal. It is much at home in our bushlands of Forest Red-gum, Spotted Gum, ironbarks, box (*Triplaris*) and bloodwood. At night in the spot-light beam when I shoot flying foxes (used as food items on our reserve) I have to be most careful to differentiate between the eye reflection of the big fruit bats and those of the pink-nosed gliders skipping from branch to branch in the Moreton Bay Figs. Only a few nights ago as we approached the garage one lively fellow skimmed the car windscreen to "land" and gaze alertly from a handy tree trunk.

During Governor Phillip's voyage to Botany Bay in 1789, this glider was collected, described, and illustrated, but owing to some confusion of notes made at the time concerning the Colonies of Port Jackson and Norfolk Island the name *norfolcensis* was mistakenly attached to the Squirrel Glider. However, as the earliest valid specific name it must remain.

John Gould, the famous bird man who also made excellent observations on Australian mammals, noted that the aborigines appreciated the Squirrel Glider as a food item and also disposed of the skins to the colonists, who used them for the trimming of dresses or for making fur necklets. Gould found the animals in bush adjoining the open grassy areas of the country rather than in the densely forested coastal ranges.

Owing to its more limited distribution the species is, generally speaking, not so well known as the smaller and very similar Sugar Glider. Apart from being nearly twice the size the Squirrel Glider is distinguished from the Sugar Glider by a longer and more pointed face, lengthier and narrower ears and a characteristically bushier tail. The longer fluffier and more squirrel-like tail has given this glider its name, though naturally none of the volplaning marsupials ever holds its tail in the true squirrel manner.

The overall length of the Squirrel Glider is about twenty inches, with a tail forming some eleven inches of this measurement. The colour is a soft pale grey and the fur is fine and slightly woolly. A well defined, almost black dorsal band runs from between the dark liquid eyes, over the head and down the back to the rump. The upper surface of the gliding membrane has a darker border fringed with white or yellow, while the under surface is white suffused with delicate yellow. Add the black patches at ear bases, the delicate pink nose, pink-soled feet, inquisitive disposition, plus extremely active movements, and you have a picture of the delightful Squirrel Glider, one of the gems of Australia's marsupial fauna.

Volplaning by means of an extension of the body skin from the fifth finger along the flanks to the ankles, the active creature has solved its transport difficulties and is able to swoop fifty or sixty yards at a time from tree top to tree trunk. So, with a minimum of time and energy, it travels considerable distances from its cosy leaf nest in a secure hollow to find flowering trees

PLATE XVIII



Mother Squirrel Glider with ten-week-old twins greedily devours a longicorn beetle larva held in her forepaws. The fringe of the gliding membrane running from the fifth digit of the forepaw is plainly seen.

PLATE XIX



Photos: David Fleay
Anxious to reclaim her "Joey", calling to her in its mixture of throaty and silant cries,
mother Squirrel Glider leaves the much-diluted sunlight.

and suitable beetles and grubs. Remember that the Squirrel Glider is not a leaf eater. The most delectable morsels with which we can supply them are the creamy concertina-like larvae ("Witchety Grubs") of longicorn beetles, and there is no question as to the enjoyment as one of the furry larrikins sits up in true squirrel fashion to devour the unfortunate grub held tightly in both fore-paws. They are also partial to moths, beetles, crickets, katydids, cicadas and grasshoppers. If necessary they will also tackle small birds and mice. During a winter period some years ago, when insect food had not been readily available, we were astounded when, in spite of an ample supply of bread and milk, sweet jam and strips of fatty meat, our Squirrel Gliders made a nocturnal attack upon a half-grown guinea fowl which lived in the same big cage. The small marsupials used their teeth to such good effect that one of the unfortunate bird's wings was stripped of feathers and a good deal of flesh! Small birds are eaten so readily that I think there is little doubt that during colder months these gliders prey occasionally upon sleeping honey-eaters and other small birds of the tree-tops.

A large part of the diet is, however, blossom nectar, sap licked from small branches pierced or stripped by the long sharp incisors, sweet exudations from trees and sugary extracts from berries and other fruits.

For all its vivacity, the Squirrel Glider is not as vocal as either the Greater Glider, *Schoinobates volans*, or the Fluffy Glider, *Petaurus australis*, two much larger species whose prolonged gurgling shrieks during volplaning activities are so much a nocturnal feature of eastern Australian bushlands.

The smaller glider nevertheless makes up for such shortcomings by its extraordinary capability in the matter of "swearing and cursing"! If handled against its will, or when engaged in family squabbles, it immediately breaks out into loud, droning, "self-starter" cursing—I can think of no more apt description—accompanied as often as not by an agonizing series of bites.

Never plunge your hand with fingers extended into the nesting hollows of one of these gliders. The tapered, narrow lower incisors measure half an inch in length and contact with them does not pay. I have known males of this species to fight so savagely in a tree that they have fallen at my feet. So crossbred were they in their private "hate" that I have been able to pick up the furry spitfires, only to become the immediate and suffering target of two pairs of sharp lower teeth at once!

As one would expect in a larger animal the droning "self-starter" notes of anger are decidedly deeper and more throaty than those of the smaller Sugar Glider. Another point of interest is that, though the Squirrel Glider is to all intents and purposes a larger edition of the "Sugar" species, it apparently lacks the little fellow's curious and distinctive habit of uttering repeated terrier-like yaps or shrill grunts of puzzlement or nervousness. It is noteworthy that the two species readily interbreed in captivity.*

Our own Squirrel Gliders at West Burleigh have built a large and comfortable cup-shaped nest of gum leaves in an old box, each leaf of the rim being stacked neatly on edge.

They live in family groups of five or six or more, but the nest does not exude the rank unpleasant odour characteristic of the Sugar Glider groups. Should a strange Squirrel Glider stray into the vicinity of an established home it is liable to receive a most hostile reception.

Owls sharing the squirrel Glider's habitat are obvious natural enemies, though evidently not a serious menace to the alert marsupials. The Masked, Sooty, Powerful and Barking Owls are those chiefly concerned. Far more

* Emphasizing the general closeness of the two animals, C. H. H. Tate wrote: "We have also a specimen from 140 miles west of Townsville, which differs very slightly from *P. brevicauda longicaudatus* in the direction of 'norfolkensis'. It is slightly larger than *longicaudatus* and the base of the tail is fuller; 75 mm. of its tip is white. But it is not nearly so large as *norfolkensis* nor is its F₁ uncoloured as in that species" (*Mammals of Cape York Peninsula, Results of the Archbold Expeditions*, No. 66.)

serious are the depredations of the common cat, both feral and "attached", and as in the case of Sugar Gliders the discovery of the thick furry tails discarded by the efficient and ruthless feline are all too common evidence of glider destruction in Queensland.

In the warm and equable climate of this Queensland region there appears to be no recognized season for the appearance of the two young in the pouch. In fact one female which reared twins four months ago already has another set of twins at the pouch-leaving stage. The gestation period is only about three weeks and the little ones at birth are more active and practically twice the size of embryo native cats (daysures) as a similar stage. Otherwise there is little difference between them.

Developing at a comparatively rapid pace, the pink infants show a covering of short fur when almost two months old. Very soon after that, though still in the blind stage, they become too large to be contained in the pouch, and simply cuddle up to the parents in the leafy nest. While father glider is out sitting hither and yon in the starlight, mother stays baby-sitting, and vice versa. There is a definite sharing of labour here in the care of the offspring. When separated even momentarily from the parents, baby Squirrel Gliders utter slow repeated cries of both a throaty and sibilant nature. The mother animal is not slow to respond, often braving the disliked daylight to enable a distressed "Joey" to grip her fur once more.

The babies' eyes open soon after they leave the pouch (at ten weeks) and subsequent growth is quite rapid. At four months they are at their loveliest—fresh, slim and with the pinkest of noses and soles. They then begin to rely on their own resources though still remaining members of the family.

Note.—Examples of *Petaurus norfolicus* from the southern extent of its range, are distinguished by an extremely bushy tail base as well as by denser coats in general.

Petaurus norfolicus gracilis De Vis, 1883, recorded from Cardwell, Queensland, is a large and differently marked animal. Originally described by De Vis as a distinct species, it is nowadays regarded as a northern race.

NOTES ON NATIVE CATS

By F. J. BUCKLAND, Mallacoota

Before moving to Mallacoota, the writer's family owned a grazing property near Delegate, in the southern Monaro district of New South Wales, and I remember the Native Cats which at that time were very abundant in the area. It is a very long time ago, shortly after the turn of the century, but, as I recall it, nearly every large heap of rocks and a great many hollow logs near our home, each had its quota of them.

They frequently raided the poultry yard at night. An uproar among the fowls was the signal to rush outside with as much noise as possible and release the dogs. The intruder usually took refuge in the nearest briar bush where it was safe, and the family would then be kept awake by the barking of the dogs as they tried to reach their enemy. One night my mother saved an old hen by her timely intervention with a stick. The Native Cat had its victim by the leg and had almost succeeded in dragging her into a briar, where she would undoubtedly have been set upon by other cats and quickly despatched.

As a small boy, it was a never-ending source of interest to me to see the Native Cats sitting on the "pack fences", sunning themselves of a morning after a frost. These fences, like the cats, are now things of the past on Monaro. They were built by the Chinamen, who piled up logs of various lengths and sizes to form sheep-proof barriers. Most of the logs were hollow and in them the cats lived in comfort and security. As one drove along the

road to Delegate in the warm morning sunshine, the animals would remain on top until the buggy was fairly close, then disappear down into the hollow logs.

When we left Monaro and settled at Mallacoota, there were still a great many Native Cats up there, but I believe some kind of disease wiped them right out. I did not ever see a live Native Cat in the Mallacoota district, but I did see two dead ones. The first was in about 1910, and the circumstance was a real bush tragedy. A Delicate Owl had flown into the top strand of a fence, and one of the barbs had penetrated its throat. A Native Cat had apparently jumped up after the owl, and it had met the same fate. There they were, both dead, the cat hooked by the throat, too, to the second wire, and hanging about a foot below the owl.

The second Native Cat I saw at Mallacoota had been poisoned; this was quite recently, in 1940. It was a fine specimen, a male, perhaps somewhat larger than the ones I remember from Monaro, though the markings were much the same.

In 1943 I was in Western Australia, and during an expedition into the Sand Plains near Jurien Bay we came across a large cave. It was in limestone formation, about a hundred feet in width and with the arch about forty feet above the entrance. Incidentally, there were three bee-hives in the crevices.

The fine sand of the floor at the entrance of the cave was covered with animal tracks. There was a freshly killed and partly eaten pademelon lying on the ground, and, on seeing it, I immediately suspected foxes. But a careful search failed to reveal any fox tracks amongst those on the dry sand. There was also the dried-out hairless body of a half-grown Native Cat at the cave entrance; and there is very little doubt that the dozens of tracks in the sand had been made by the same animals.

There was a colony of them, and they lived away back under the cave walls which came down to within a foot of the floor. The pademelon was very small and had evidently been killed by the cats somewhere close at hand during the previous night and dragged to where I saw it.

When searching about for bones and animal tracks, I was amazed to discover half-a-dozen small fish lying in a neat heap. They resembled pilchards and were about five inches long. Close examination showed that they were dried-out empty shells, still retaining all their scales and the original shape. They had apparently been there for some time.

This cave was at least four miles from the sea, and one is left wondering that the fish were carried so far across country and left, uneaten, in the Native Cats' den.

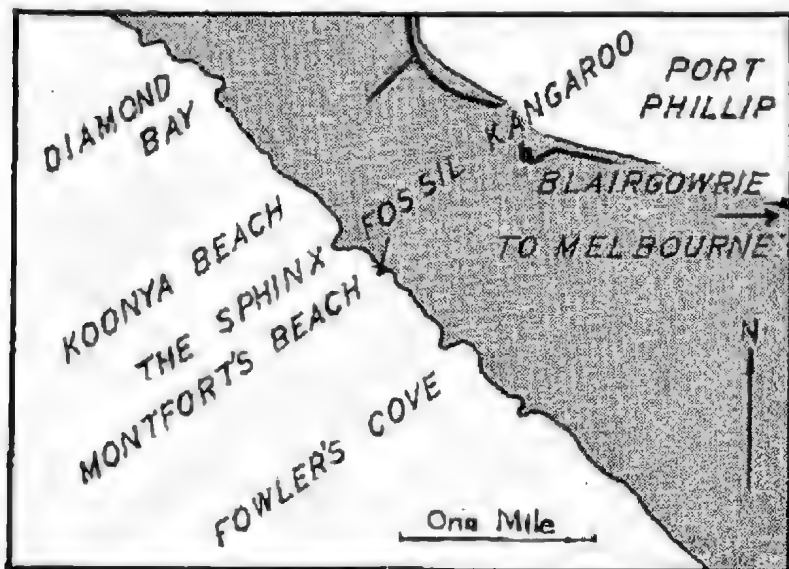
[Note—The Mallacoota Native Cats would probably be the Eastern species, *Dasyurus quall*, which survives in a very few Victorian localities, including Studley Park, Melbourne. Those on the Monaro Plains may have been the Western Native Cat, *Dasyurus geoffroii*. The Jurien Bay area is within the range of the West Australian race of the latter, *D. geoffroii fortis*. Both the Eastern and the Western Native Cats are partial to fish.

In *Furred Animals of Australia*, Ellis Troughton records the southern *Dama Pademelon* as being represented in the south-west of the continent by a race, *Thylagale eugenii derbiana*, known there as the Tammar; while a smaller species, *Setonix brachyurus*, the Quokka or Short-tailed Pademelon, is listed too. Both species are stated to extend on the mainland as far north as Moore River, so Mr. Buckland's record from near Jurien Bay is very interesting. The small size of the specimen he saw suggests that it might be the latter species, which is not much larger than a big rabbit.—EDITOR.]

EXTINCT GIANT KANGAROO FROM THE HEPEAN PENINSULA, VICTORIA

By EDMUND D. GILL*

The Nepean Peninsula consists mainly of ancient dunes turned to stone, for there was formerly a big dune system right across what is now the mouth of Port Phillip Bay. The lines of dunes ran from Queenscliff across to Rosebud and from Point Lonsdale across to Portsea, and indeed this is why Port Phillip has so narrow and so shallow an entrance. The dunes turned to stone constitute a bay bar (Kebble 1950).



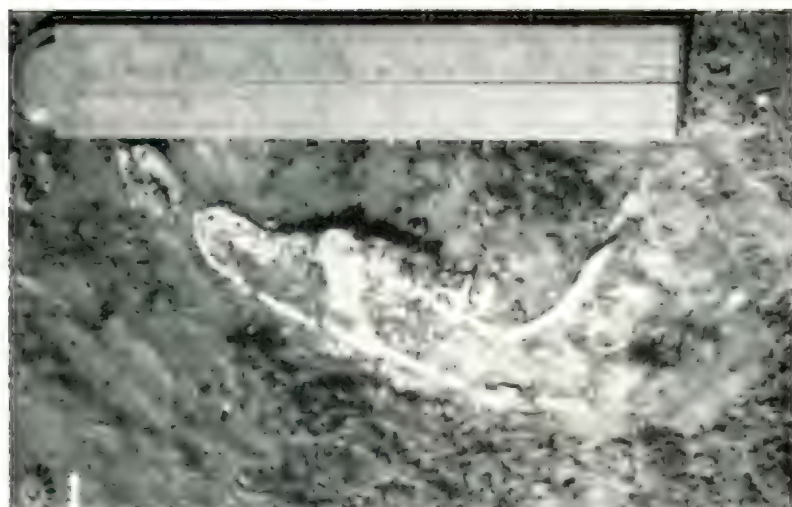
Text-figure 1: Location of fossil kangaroo on Nepean Peninsula.

The sand of these ancient dunes was not quartz sand but calcareous sand formed by the fragmentation of the skeletons of innumerable marine animals—the shells of molluscs and forams, the hard parts of polyzoa, the framework of echinoderms, and the tests of many other organisms. Some of the calcium carbonate from this lime sand was dissolved by percolating waters and re-deposited as a cement, thus turning loose sand into solid rock. Because the sand was built into dunes by the wind, this rock is often called *aeolianite* (after Aeolus, the god of the winds), but those who prefer a descriptive to a genetic name call it *calcarenite* (literally lime-sand-rock).

Erosion and soil formation reduced the former hilly dunes to a flat or undulating surface on which yet another series of dunes was built, so that now we have hundreds of feet of limestone (as proved by the Sorrento Bore—Chapman 1928) consisting of layers of aeolianite separated by fossil soils or intercalations of marine rock—a geological club sandwich. The fossil soils are terra rossas, which are usually 18 inches to 3 feet thick. Such a soil represents a good deal of erosion and the passing of a not inconsiderable period of time, for each foot of soil is what is left from the breakdown of 30 feet or more of rock.

* Curator of Fossils, National Museum of Victoria.

PLATE XX



Photos: E. D. Gill

Fig. 1.—Ramus of lower jaw of young *Macropus utai* as seen in shore platform at Montfort's Beach.

Fig. 2.—View from cliff above shore platform at Montfort's Beach at low water spring tide. The figures are standing round the fossil kangaroo.

PLATE XXI

*Photo: N. Shaw*

Cliff of aeolianite at Fowler's Cove.

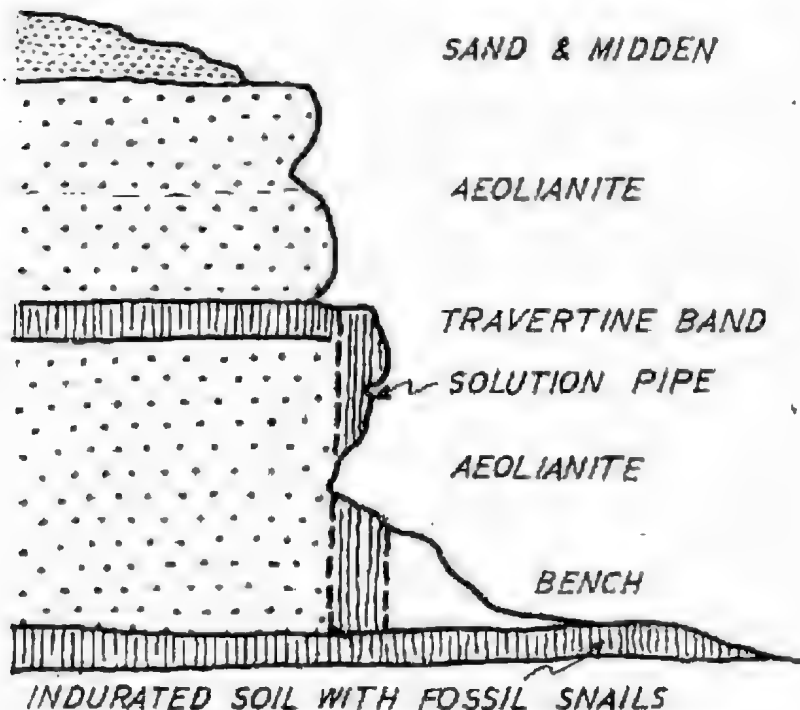
Top left is a fossil soil, and on right of figure is a solution pipe opened by coastal erosion to show fossil soil inside (marked by hammer).

Above figure is part of a second solution pipe.

CHANGING CLIMATES

Thus enormous forces of construction have alternated with forces of destruction. Dunes have been built, solidified, then ground down so that the remaining portion is but a minor percentage of the original big dune system. Changing climate must have caused the switch from dune-building to dune-breaking. A comparatively dry climate is necessary for the amassing of a big dune series, because a wet climate causes a heavy vegetation to screen the sand, preventing its distribution by the winds. Then a soil forms, the dunes are reduced by leaching and erosion, percolating waters cause cementation, while solution pipes and such features develop. As the wet climate eases off, conditions of wetting and drying cause the solution pipes to be coated with travertine, or even choked by it. Plate XX1 shows an aeolianite cliff at Fowler's Cove with a solution pipe opened up by coastal erosion; the pipe is lined with $1\frac{1}{2}$ to $2\frac{1}{2}$ inches of travertine then infilled with a red fossil soil containing fossil snails. At the south-east end of Fowler's Cove a solution pipe was noted which was infilled with a red snail-bearing fossil soil in which were the roots of an ancient tree replaced with travertine.

The alternation of dune rock and fossil soil in the Nepean Peninsula thus provides evidence of alternating dry and wet climates. The structures are illustrated by a coastal section at Pearce's Beach, which is south-east of Fowler's Cove (see text-figure 2). How many phases of dune-making and dune-breaking are recorded in the rocks of the Nepean Peninsula has not



Text-figure 2: A typical coastal cliff at Pearce's Beach. The section shown is approximately 25 feet high.

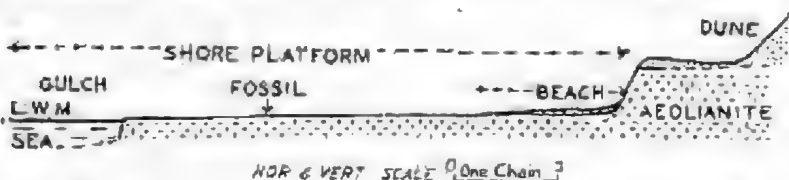
been worked out yet, but that quite a number are involved is shown by the Sorrento Bore (Chapman 1928) and the Wannaeue bores (Kehle 1950).

Although built by the wind, the aeolianite extends far below present sea-level, as also do some of the fossil soils and solution pipes. Changes in the relationships of land and sea have therefore obviously taken place, and for this there are two reasons—the Port Phillip fault system, and the eustatic changes of sea-level brought about by the alternative building up and wasting away of ice masses during the Ice Age.

EXTINCT KANGAROOS

Professor J. W. Gregory (1902) described from Fowler's Cove on the Nepean Peninsula a giant extinct kangaroo which he compared with *Palorchestes azael*. An incisor tooth from this specimen is in the National Museum (reg. No. P 7419), and the rest of the bones found are in the Department of Geology, University of Melbourne. It was therefore with considerable interest that the writer heard from Mr. John Thomson in 1951 that there were further vertebrate remains embedded in the aeolianite at Montfort's Beach, near Blairgowrie, about half a mile north-west of Fowler's Cove (text-figure 1). Gregory's fossil was discovered in the aeolianite shore platform where waves had exhumed it, and in this same manner the fossil now reported became visible. The platform surface is a little above mean low tide, as can be seen by the upper limit of the kelp in Plate XX, fig. 2, and much of it is covered with seaweed (*Hormosira*) meadows, algae, patches of calcareous tube worms (*Galeolaria*), colonies of mussels (*Brachydontes rostratus*), and numerous limpets (*Cellana tramoserica* and *Patelloida latistrigata*).^{*}

Soldiers stationed in the area during the war noticed bones in the shore platform and tried to dig them out with bayonets but the rock was too tough, being densely indurated with calcium carbonate. All the visible fossils were ultimately dug out at low tide with hammers and cold chisels with the help of Noel Shaw, John and Peter Thomson, and Malcolm Kidson. They consist of a carinulum somewhat truncated by the erosion of the shore platform, a ramus similarly affected (Plate XX, fig. 1), a piece of a second ramus, a portion of a rib, and numerous fragments, totalling some 23 fossils in all. The bones are white (where exposed) to cream in colour, and heavily mineralized. A surveyed section (text-figure 3) shows their position in the shore platform.



Text-figure 3: Measured section of the shore platform at Montfort's Beach, showing location of giant fossil kangaroo. Compare Plate XX.

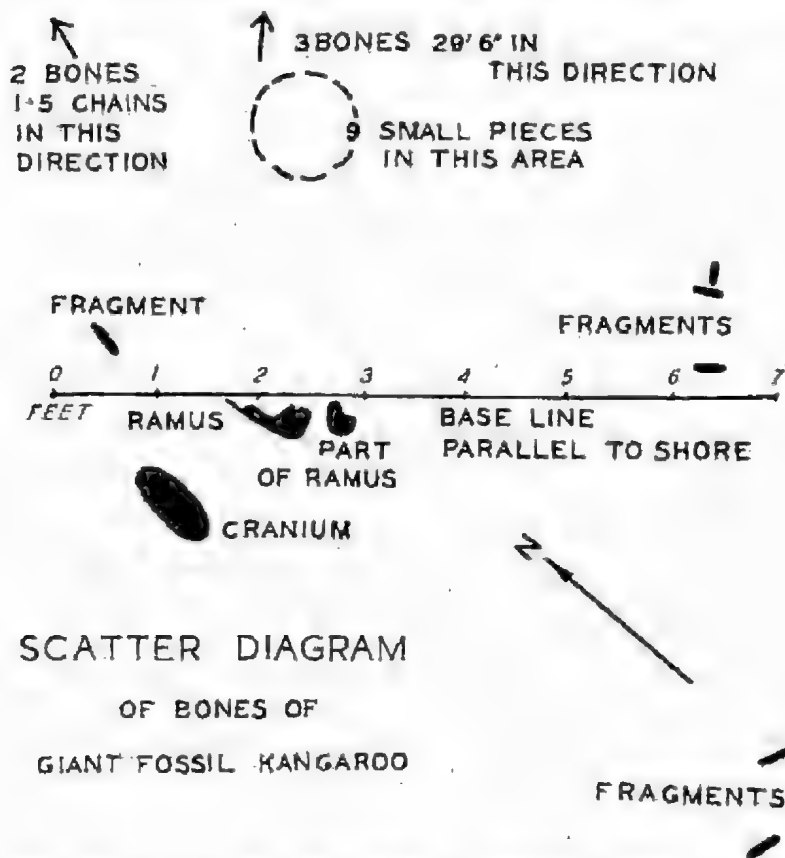
The distribution of the bones laterally in the shore platform is shown by the scatter diagram in text-figure 4. No doubt there were some bones at a higher level which have been destroyed by marine action, and there are probably some still out of sight under the surface of the shore platform. All the bones seen could belong to the same animal and indeed fossil marsupials are so rare in this formation that one is safe in assuming this to be the case. Besides the two fossils mentioned above, the only other fossil vertebrate known to

* Shells kindly determined by Miss Hope Macpherson, Curator of Shells, National Museum of Victoria.

me from the aeolianite of the Nepean Peninsula is a fragment of a rib of a giant marsupial found by Mr. E. N. Hall at the Rye back beach (Military map, 1931 Sorrento Sheet, grid reference 860, 643).

HOW WERE THE BONES SCATTERED?

It is interesting to consider how the bones became so distributed and broken. The rock in which the bones are preserved is a lithified soil, red in colour, clayey (so that many springs emerge on top of it along the coast), and enclosing numerous fossil snails and some charcoal. The soil is approximately horizontal and so the bones were not scattered by sliding down a



slope. The soil was traced in the cliffs for a considerable distance and so it is not just a local development but an old land surface. The aeolian dune structures underneath are truncated by it, while the sand of the fossil dune above it lies horizontal where in contact with the soil. That the giant kangaroo from near Blairgowrie (*Macropus titan*) lived in a time of soil formation and not dune formation shows that the climate was relatively wet. This is borne out by the fossil snails which are very numerous and of the small planispiral type referable to the genera *Laoma*, *Puralaoma*, and *Rhytida* which live in damp places such as under decaying wood and around moss.

The charcoal in the soil bears evidence of vegetation, and of fire which could be either a natural bush-fire or a man-made one. On present knowledge it would appear that the time concerned was before the aborigines reached this part of the world, and so the charcoal is more likely to be the result of a natural bush fire, caused perhaps by lightning. If the heavy bones of this kangaroo were not broken and distributed by man, a predatory animal must surely have been the cause. In late Pleistocene times, *Thylacynus* the Tasmanian wolf, and *Sarcophilus* the Tasmanian devil, including forms bigger than the present ones, lived on the mainland (Gill 1953a). The unworn condition of the incisor and molars of the Blairgowrie kangaroo show that it was still a young animal when it died.

We are justified therefore in bringing this young *Macropus titan* alive in our imagination on a terra rossa soil in a flat or slightly undulating countryside enjoying a fairly wet climate which would give an ample vegetation. Numerous little planispiral snails crawled amongst the vegetation and under decaying logs and leaves. In the bush lurked marsupial carnivores which included the kangaroos in their diet.

DATING THE BLAIRGOWRIE KANGAROO

The loose sand overlying the aeolianite is quite recent, and in many places preserves a dune morphology. Some sections show in this sand an immature fossil podsol soil of light grey colour, containing numerous *Austrosuccinea* snail shells. This soil sometimes bifurcates into two soil layers, but they are never very far apart. Similar sands with similar fossil soils characterized by large numbers of *Austrosuccinea* have been observed overlying aeolianite at many points round the coast of Victoria as far as the South Australian border. *Austrosuccinea* has been found only in the podsols of the recent sands and not in the terra rossas of the aeolianite. Aboriginal kitchen middens occur on, in, and under this sand formation, but have not been found in the aeolianite. Middens are common in the Montiorri's Beach area, and are characterized by rock shells of the *Turbo* (*Subnitella*) and limpet types. A midden on The Sphinx included numerous bird bones and some remains of egg shells.

The contact between the more or less loose sand and the underlying aeolianite is an erosion surface, and may represent quite a period of time. Structures (such as solution pipes) in the aeolianite indicate a pluvial period since the time of the fossil kangaroo, and this may well be one of the phases of the last glacial period. Our understanding of the Quaternary period is all too scant, but we can say that *Macropus titan* roamed the area now called the Nepean Peninsula in Upper Pleistocene time. This kangaroo was probably the most numerous of the giant kangaroos of that time, and has been found in many Victorian localities (Gill 1953 b, c).

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PROCEEDINGS

About 120 members and friends were in attendance at the General Meeting of the Club at the National Herbarium on March 9, 1954.

Miss Julia Walsh and Miss Helen Evans were elected as Ordinary Members, and Mr. Ralph O'Brien as Junior Member. The President, Mr. A. A. Baker, warmly welcomed these new members to the Club.

The President then called upon Miss Jean Blackburn to deliver her lecture on a walking holiday to Mt. Bogong and the High Plains. Miss Blackburn very ably described the trip which she and several Walking Club members had made in the 1952/3 Christmas season. Starting from Tawonga Gap they spent six days on the High Plains, thence proceeding to Mt. Bogong. Miss Blackburn showed an excellent series of Kodachrome slides featuring the geology and flora of the Plains, notable amongst the latter being the Alpine Pimelea, the Royal Grevillia and other rock loving plants. She also showed some excellent panoramic views of the wonderful mountain scenery of this attractive part of Victoria. Hearty thanks were expressed to Miss Blackburn.

The President mentioned the gift by the University of a colour film of the Mistletoe Bird to His Royal Highness, the Duke of Edinburgh. This excellent film had been made by Mr. Ray Littlejohns. He also congratulated Miss Ina Watson on the selection of one of her books on the Lyrebird as a gift to the Royal children.

The Secretary reminded members that nominations for the various offices of the Club were due at the April meeting, also nominations for the Australian Natural History Medallion for 1954, and particulars of special business which members may desire to have discussed at the Annual Meeting.

Dr. Chattaway moved that copies of the March Special Fauna issue of the *Naturalist* and the Lyrebird issue be forwarded to our Patron, Sir Dallas Brooks, for submission to Her Majesty, the Queen, if he thought fit. This was approved unanimously.

After several members delivered nature notes and discussed the specimens on exhibition, the President adjourned the Meeting for the usual conversation and examination of exhibits.

NATURE NOTES AND EXHIBITS

February Meeting—

Landshells of the genus *Paryphanta* were exhibited by Mr. C. J. Gahnel, who made the following comments: *P. atromentaria* Shuttleworth, of the Dandenong Ranges, Marysville, etc., has a somewhat flattened dull shell and the animal is salmon-pink. *P. compacta* Cox and Hedley, of the Otway Ranges, Lorne, Apollo Bay, etc., is more conical and more polished, while the animal is grey. Neither the eastern nor the western species has been recorded from the district of the other.

Several snake exhibits were shown and commented upon by Mr. J. R. Garnet. The re-articulated skulls of four of Victoria's venomous snakes, Copperhead, Death Adder, Black Snake and Tiger Snake, illustrated the characteristic dentition of each species. The fangs of the Death Adder have the poison ducts within the body of the tooth, while in those of the others it is a groove on the outer surface. For comparison, a Carpet Snake skull demonstrated the formidable though non-venomous array of teeth.

A further exhibit by Mr. Garnet was of an 8-inch Tiger Snake with the ventral scales dissected away to show a similar young reptile lying along the whole alimentary canal. It had been swallowed, all but the last inch of its tail, this feat being made possible by the property of dislocation of a snake's jaws which are not hinged ball and socket fashion as in mammals but linked by extensile muscles.

Note on the Slender Treefern, *Cyathea cunninghamii*: At Britannia Creek, south of Yarra Junction, Miss M. Elder found a single plant of this species growing in a narrow and shallow erosion gully. Though the mature Slender Treefern usually bears its fronds far out of reach on a tall slender trunk, this specimen bore easily accessible fertile fronds on a trunk only about six feet high.

Note on Hyacinth Orchid, *Dipodium punctatum* in cultivation: Mr. N. A. Wakefield commented that he had seen an example of this orchid which had been growing for two years and flowering each season in the fernery of Mr. W. Meddings of Sarshfield in East Gippsland. It was in earth in a kerosene tin, and at the time there were three stems bearing flower-spikes.

[In *Pict. Nat.* 64: 8, May 1947, Mr. Chas. French gave notes on a similar instance of this species flowering in a pot. In that case the plant flowered again after being dormant for two seasons.—Editor.]

Note on the Yellow-tufted Honeyeater*: Mr. N. A. Wakefield reported that in January last Mr. C. E. Bryant and he observed and identified these birds in several places in the Cann, Wingau and Genoa River areas in the far east of Gippsland. Mr. W. B. Hitchcock records the same species from the Snowy River (near Deddick) and Suggan Buggan, and specimens have been collected at Timbillica on the Prince's Highway two miles within New South Wales. Mr. Wakefield reported an excursion to the spot near Merimbula where Mr. F. E. Wilson recorded the Helmeted Honeyeater several years ago, and finding there a colony of Yellow-tufted Honeyeaters.

*Since this report was made to the Club, a great deal of further information on the subject has come to light, and it is intended that the matter will be dealt with at length in a future issue of the *Naturalist*.—N.A.W.]

March Meeting

Female Red-backed Spider (*Latrodectus hasseltii*) with four egg sacs and spiderlings, collected near ground level in a fernery at Pascoe Vale on February 27, 1954. The exhibitor, Mr. J. R. Garnet, remarked that the spiderlings usually emerge in the autumn months. On a previous occasion he had made an approximate count of the contents of seven egg sacs and concluded that the number of eggs produced by the spider during a season of bountiful food supply could easily reach 1,000. There were between 500 and 1,000 spiderlings, both hatched and unhatched, in the exhibit jar. The untidy web in which were enmeshed the chitinous remains of beetles, slaters and black field-rickets is characteristic of the spider.

Mr. A. W. Hurston commented on an excursion to the Mitchell River Gorges and mentioned in particular a huge kurrajong tree which grows near the confluence of Deadcock Creek and the Mitchell River.

GEOLOGY DISCUSSION GROUP

The February meeting was held at the National Museum, 14 members and visitors being present. Mr. Jenkins gave an account of the Club excursion on December 5 when the Trentham and Sailors Falls and Mt. Franklin were visited. During the evening short talks were given by Mr. Blackburn on the epidiorite and granite of Ceres, near Geelong, and the dacite and granite of Arthur's Seat; by Mr. Baker on the rocks of Cape Paterson and Waratah Bay; by Mr. Gill on his New Zealand visit; and by Master Bock on volcanic bombs and tertiary marine fossils from the Camperdown district. All speakers exhibited specimens illustrating their talks.

The March meeting, held also at the National Museum, was attended by 15 members and visitors. Mr. Baker reported on a Group excursion on February 7, when, with members of the Frankston Field Naturalists Club, the tertiary fossil deposits of Grice's Creek were visited. The subject for the evening was the Geology of Geelong, and the two speakers, Messrs. Jenkins and Jeffrey, gave accounts of the ages and faulting of the rocks and the fossil flora of the Jurassic sandstone of the area.

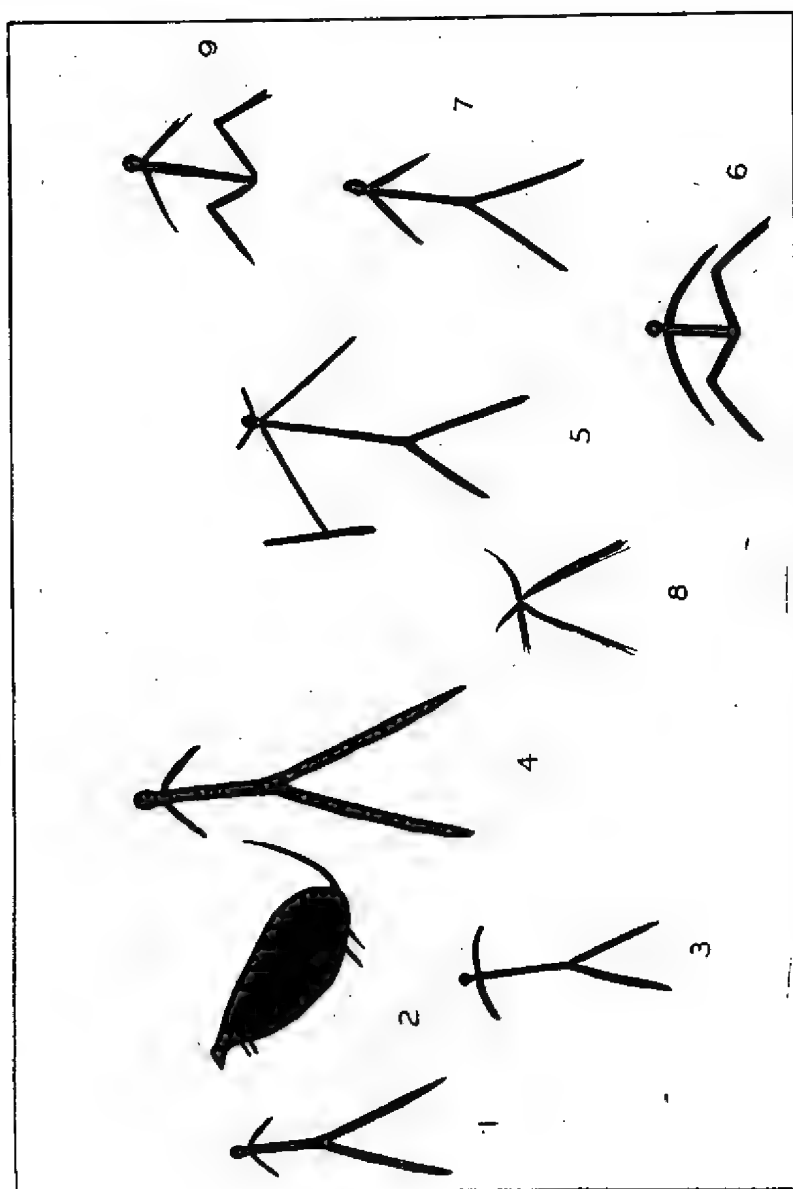
PETROGRAPHS IN THE KOETONG CREEK VALLEY

By S. R. MITCHELL

This paper places on record the occurrence of aboriginal rock-paintings in the valley of Koetong Creek, the only examples so far known in the north-eastern part of Victoria. Several others have been recorded in Western Victoria, most of them being in the Victoria Range, the most western part of the Grampians.

Matthew (1897) described the well-known Glen Isla rock-shelter in the parish of Billiminh. This site is about five miles east of the Glen Isla homestead close to the main road between Horsham and Hamilton. Barren (1943) recorded paintings in the Brimlower Cave three miles west of the Glen Isla site. Another painted rock is that on the flank of Mt. Zero, on the northern end of the Grampians. The only other occurrence in the Western District is on the southern slope of Langi Ghiran near Buangor, about eight miles east of Ararat. This was described by Kenyon (1929). Rock shelters with stencilled hands are known to exist at other places in the district but have yet to be recorded.

Through the efforts of the Anthropological Society of Victoria and the F.N.C.V., three of these precious memorials of aboriginal art are now protected from vandalism by substantial fencing. These are at Glen Isla, Mt. Zero and Langi Ghiran. The Cyclone Company of Australia generously donated the fencing material and it was erected by the Forests Commission.



Copies of Petrographs in Koetong Creek Valley. (See text)

Koetong Creek is a tributary to the Murray River which it joins close to Bungil. The rock-paintings are on the western side of a large granite tor high up on the southern slope of the valley, approximately four miles in a northerly direction from Darbyshire, a station on the Wodonga-Cudgewa railway line. Koetong Valley is eroded to at least 1,200 feet deep, and the country in the vicinity of the painted-rock is very rugged, with numerous large granite tors. It carries a sparse growth of trees, mainly stringy-bark, box, blue-gum and acacias.

The country rock through which Koetong Creek has cut its valley is a moderately coarse-grained granitic type. From a very massive tor, rock has broken away from a joint plane, resulting in the exposure of a moderately smooth inclined face, roughly fourteen feet wide and eight feet high. A stone overhang of about five feet has served to protect the paintings to a certain extent. A small slab of rock has also separated from the lower right-hand side, and on the exposed face a squatting or dancing figure (Fig. 6) is depicted. The background on which the paintings are, is light buff in colour and on the whole the figures show up well.

There are seven well-defined conventionalized human figures, some possibly representing mythical beings, and a number of markings much too obscure for recording. One figure appears to represent a kangaroo or wallaby (Fig. 2) with the tail, probably a later addition, placed in an unnatural position. Through lack of sufficient space the tail was made to curve upwards. The figures range in length from twenty-eight inches (Fig. 4) to eight inches as in Fig. 6. Fig. 3 shows a round head, but in the others the head is oval. Fig. 5 is a conventionalized human figure with pronounced extensions of the ears, and one hand grasps a stick, possibly representing a spear.

These paintings were probably executed with a brush made of vegetable fibre, and a red pigment. Atmospheric weathering has caused bleaching to a light pink, and in some cases the colour appears to have run. This is suggested by the lower extremities tapering off to a point.

The natives who frequented this area belonged to the Walgal tribe of New South Wales (Howitt 1904). Both sides of the Murray River would naturally be embraced in their tribal confines. Howitt states that the Walgal people journeyed annually into southern Victoria, and Koetong Creek was probably one of their tracks. Such a secluded spot as this rock would be ideal for carrying out initiation and other ceremonies, and it is also significant that the only animal figure in the series is a kangaroo, one of the Walgal totems.

The paintings have been known to the local people for many years. In 1930 the late Mr. A. S. Kenyon, J. R. Rhymill and myself visited Koetong but failed to locate the site. About 1936, Mr. Kenyon and myself, under the guidance of Mr. Cecil Webb of Tallangatta, visited the site, but only rough drawings were made. During a recent visit in 1950, again under the guidance of Mr. Webb, the site and the paintings were photographed and measured.

I wish to tender thanks to Miss Gwen Walsh of the Adelaide University for the reproductions of the drawings, and to Mr. R. A. Keble, former Palaeontologist to the National Museum, Melbourne, for helpful suggestions.

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NOTES ON A PHYNNID WASP

By N. A. WAKEFIELD

While gardening a few weeks ago I turned up the remains of a partly eaten mole cricket together with the insect larva which had been responsible for its demise. Judging by the size of the parasite and the fact that adults had been seen about, it was taken to belong to the species of wasp, the female of which is commonly known as the "Blue Ant".

An adult female was later brought to light and also a pupa of the same species, and a week later two males were seen. Mr. A. N. Burns, entomologist at the National Museum, confirmed the identification of the larva and supplied the classification details of it and the cricket.

The "Blue Ant" is not an ant, but the wingless female of a Phynnid wasp, *Dumma bicolor* Smith. It is commonly seen in backyard gardens and such places, usually in hot weather, and its inch long iridescent blue body is rather striking in appearance. When molested it moves by a series of rapid runs with its abdomen elevated, and one must beware, for its sting is severe.

The larva was unearthed from a depth of several inches in hard earth previously uncultivated. It was about three-quarters of an inch in length, white in colour with a yellowish apical tip to the abdomen, and the head bore a pair of active "nippers". Its body was quite stout, perhaps twice the weight of that of the adult female.

The victim was a large light brown mole cricket, probably of the species *Gryllotalpa africana* Pal. de Beau, which is found also in Africa and may not have been originally native to Australia. The "Blue Ant" is the only known parasite on the mole crickets. This particular cricket had been a large specimen and was almost completely gone, only parts of the skin of the abdomen, a wing, the shell of the thorax and the large legs remaining.

The pupa-case of the wasp is oblong-elliptical in shape, a little over half an inch in length and finely woven of reddish-brown silky threads. It also is usually some inches below the surface of the ground.

Mr. Burns commented that the winged males of the wasp were usually seen on the flowers of tea-tree but could be attracted by caging the female. This experiment was carried out about a week after the making of the first observations. Another "Blue Ant" was seen in the garden, and it was covered with a small fly-wire cage. Within a minute or so two males approached, flying swiftly in circles and finally landing on the ground by the cage.

These males were smaller insects, the body black but with whitish transverse bands on the abdomen, and the legs were dark red. Their antennae were vibrating and it was evidently a case of that insect "radio" the exact nature of which is as yet not known. There were some Red Gum trees about fifty yards away, and the nearest tea-tree was about a hundred yards distant on the other side of a large house.

Males of the Ichneumonid, *Lissonimpha excelsa* (Syn. *L. semipunctata*) were seen to approach the blooms of various species of Tongue Orchid (*Cryptostylis*) in exactly the same way when such were being handled at Orbest in the 1937/38 summer season. It was obviously a sexual attraction as by a female, but the significant point is that the orchid blooms had the same property of attraction as did the female fly. This indicates that it is something akin to scent which is picked up by the remarkably sensitive antennae of the males.

In *Vict. Nat.* 50: 41 *et. seq.*, Edith Coleman discussed to some length this subject of the attraction of both female wasps and orchid blooms for the male insects.

TWO NEW VICTORIAN SPECIES OF ALPINE COMPOSITAE

(Celmisia sericophylla and Podolepis robusta)

By J. H. WILLIS, National Herbarium of Victoria

1. CELMISIA SERICOPHYLLA J. H. Willis;

species nova ex affinitate *C. longifolia* Cass., a qua in situ ad aquam, foliis flaccidis utrinque sericeo-villosis, involucri squamis lanatoribus, acheniis brevioribus (5-6 mm. longis) et pappo viduum excedentibus differt.

Herba perennis alpina dense caespitosa, ad ripas aquam impendens. Folia fascicula argentea linearia, usque ad 25 cm. longa x 10-25 mm. lata, apice subobtusata, utrinque indumento molli sericeo-villosa obsita; omnes pili recti (non flexuosi). 8-14 mic. diamet. Scapus usque ad 20 cm. altus lanuginosus defoliatissimus (sed bracteis 6-12 linearibus conspicuis praeditus, ut in *C. longifolia*). Capitula capsum 3-6 cm. lata, circiter 150-flora (circa 50 flores ligulati incl.). Involucri squamae usque ad 15 mm. longae, lucidae, acuminate, extrinsecus omnino lanuginosae, intus glabrae nitidae ad apicem purpureae. Flores hyalidae usque ad 25 mm. longae, albae, interdum rosaceo-lineati, stylis ramulis 1-2 mm. longis, ligulati, obtusi, obscure papilloso. Flores tubulati usque ad 10 mm. longi, flavi, prope centrum capituli nobilis, lobis obtusis apice cucullatis papilloso; antherum 3-4 mm. longum, quasi omnis flosculus circ. triplo brevius (cf. *C. longifolia*); stylis ramulis fortiter acute papilloso; antherae lineares, circ. 3 mm. longae; pollinis granula circ. 18 mic. diamet., acriter echinulata. Pappi recti circ. 40, librae usque ad 6 mm. longae, breviter barbellatae, versus apicem saepe flavescentes. Achania linearia, 5-6 mm. longa, subobtusata, sericea, pili brevibus erectis appressis.

VICTORIA.—Endemic on Bogong High Plains, above 5,500 ft.: Cascades along southern head of Big River, below Spion Kop, 3 February 1949, J. H. Willis (HOLOTYPE, in MEL); Head of Middle Creek near Mt. Cope hut, 10 January 1946, J. H. Willis (MEL); Head of Bundarra River 1 mile E. of Mt. Cope, 12 January 1954, Coryl J. Skewes (MEL); E. slope of Mt. Nelson, on tributary of Big River, 15 January 1954, Coryl J. Skewes (MEL); ? Rocky Valley, 2 January 1923, H. B. Williamson (MEL).

This magnificent plant, with soft silvery-grey foliage and marguerite-like heads, is one of the most attractive botanical features of the Bogong High Plains where it flowers abundantly during January and February; the name "Silky Daisy" is here proposed as a suitable vernacular. It is confined to rocky stream banks, at altitudes of about 5,500 feet or more, and is not uncommon between Mt. Bogong and heads of the Bundarra River near Mt. Cope (a lineal distance of some 15 miles). Particularly fine examples occur around shaded pools at Howman Falls on Mt. Bogong and along cascades of the Big River source immediately north of Spion Kop (see Plate XXII).

There are no undoubted records from beyond this region, in which the new *Celmisia* would seem to be endemic. A specimen in H. B. Williamson's herbarium was labelled "summit of Cobheras, 6,000 ft.", but it is almost certain that the label originally referred to examples of *C. longifolia* Cass. (which is common there) and had been subsequently misplaced. Another specimen was mixed with a collection of *C. longifolia*, var. *latifolia* F. Muell. ex Benth., from the summit of Mt. Wellington, Vic. ("among eucalypt thickets") in F. von Mueller's herbarium; but the habitat is wrong for *C. sericophylla*, and it is most unlikely that the sample came from Mt. Wellington—it could have been carelessly left in the folder of var. *latifolia* by someone making comparisons.

Baron von Mueller never reached the Bogong High Plains proper [see "Baron von Mueller's Australian Alps" by N. A. Wakefield, *Vic. Nat.* 66: 175 (Jan. 1950)] and so he missed finding the present handsome *Celmisia*. The first reference to this plant appears to have been made by H. B. Williamson, in describing a trip to the High Plains during January 1923. Concerning plants observed in bloom along Rocky Valley he mentions [*Vic. Nat.* 40: 90 (Sept. 1923)]: "the luxuriant form of *Celmisia longifolia*, var. *latifolia*, with large daisy-like flowers and broad silky-woolly leaves".

Williamson's accompanying plate [l.c. T. VI] leaves no doubt as to the daisy which so attracted him. It is curious that such a keen observer should have been satisfied to link *C. sericophylla* with the broad-leaved variety of *C. longifolia* as a "luxuriant form". In habitat, habit and general aspect, the former is quite dissimilar to any known variant of *C. longifolia*, which often grows near it but on higher, drier ground away from the water.

The foliage in *C. longifolia* is invariably rigid, with the glabrescent upper surfaces of the leaves contrasting strongly with the ventral faces where a web of intricate flexuose hairs gives the characteristic and permanently silver, lustrous appearance (hence "Silver Daisy")—in *C. sericophylla* the drooping flaccid leaves have a uniform velure, above and below, of straight silky hairs. Other differences are apparent in the involueral bracts, the proportional dimensions of ovary and pappus, and in the achenes. These distinctions may be summarized in tabular form, thus:

	<i>C. SERICOPHYLLA</i>	<i>C. LONGIFOLIA</i> , var. <i>LATIFOLIA</i>
Habitat	Rocky stream banks, overhanging water	Grassy places away from running water
Habit	Growing in well-defined tussocks	Often forming extensive sheets of "rosettes"
Leaves	Oblanceolate-linear, to 25 cm. x 10-25 mm., flaccid and drooping	Oblanceolate, to 40 cm. x 20-30 mm. (Haldinger Range, March 1861— <i>H. Mueller</i> , 'Type of variety'), straight and rigid
Surface	Both leaf surfaces with a thick permanent vestiture of forwardly appressed silky hairs; velutinate to the touch; hairs all straight, 3-4 mic. in diameter	A striking disparity between upper and lower leaf surfaces: the upper at first with a sparse indumentum of straight hairs (10-20 mic. in diameter), then—almost glabrous; lower with a permanent web of intricate flexuose hairs (6-10 mic.), giving a silvery-white sheen
Bracts	Densely villous over the whole exterior	The tips at least glabrescent
Ovary	In disk-flowers 3-4 mm. long, about one-third of total floret	In disk-flowers 5-6 mm. long, much more than one-third of whole floret
Achene	3-6 mm. long, hardly longer than the pappus at maturity	7-10 mm. long, exceeding the pappus in length when mature

2 *PODOLEPIS ROBUSTA* (Maid. & Betche) J. H. Willis, stat. nov.

P. longipedata A. Cunn. in DC.,

var. *robusta* Maiden & Betche in *Proc. Linn. Soc. N.S.W.* 23: 12 (1898).

P. acuminata R. Br. in Ait.,

var. *robusta* (Maid. & Betche) J. H. Willis in *Vict. Nat.* 59: 120 (Nov. 1942).

Haec species a *P. jaccoides* (Sims) Druce [*P. acuminata* R. Br. in Ait.], *P. longipedata* A. Cunn. in DC. et specibus aliis descriptis distinguitur: habitu perrobusto, foliis rosulatis, inflorescentia lanuginosa subcongesta (pluricape), laminis involucri squamæ obtusioribus prominente latiore arcuatis indistincte nervosis, achenio glabro (non papilloso).

Herba perennis acaulis alpina, in pratis graminosis humidis crescens, caeculas maxime (usque ad 30 cm. diamet.) formans. Folia rosulate, oblanceolato-apiculata, integra, apice subobtusæ, usque ad 20 cm. longa x 3.5 cm. lata (ræpe parviora), subcrassiuscula omnino glabra, versus inflorescentiam in bracteas foliaceas mutantia. Inflorescentia

epithet, I have adopted the very appropriate varietal one, '*robusta*', and have chosen E. Betcher's collection from Kiandra district as lectotype of the new species.

The original description, quoted above, was so very inadequate that a detailed diagnosis in Latin is now presented. The distinctive characteristics of *P. robusta* are its:

large, glabrous, obtuse, rosulate leaves; congested panicle of heads with woolly-white branches; laminae of the involucrel phyllaries obtuse, finely wrinkled, almost nerveless and with loose areolation of cells about 25-35 mic. wide (wider than in any other eastern species).

NOTES ON ANOTHER MOUNTAIN *PODOLEPIS*

[*P. hieracioides* F. Muell. in *Fragmenta Phyt. Aust.* 1: 112 (Apr. 1859)]

By J. H. WILLIS

The name *Podolepis longipedata* A. Conn. in DC. has been applied to highland populations in southern Australia which are manifestly distinct from the original material collected by Cunningham at Moreton Bay—a widespread plant, from the rivers of New England (N.S.W.) along the Queensland coast to Rockhampton, and inland to the Maranoa. True northern *P. longipedata* has very numerous small and closely imbricate involucrel bracts with short, pointed, triangular, finely striate and often fimbriate laminae which are very sharply differentiated from their cluets, giving a dappled effect to the whole capitulum, achenes are strongly papillose. Mitchell's Maranoa River plant, which Sonder described as a new species *P. mitchellii* [Linnaea 25: 508 (1852)], has heads precisely the same and appears to be no more than a dryland annual form.

F. Mueller published as a new species *P. hieracioides*—a subalpine polyccephalous plant that he found along the Delatite, Macallister, Mitta Mitta and Snowy Rivers, in open eucalypt forest above 2,000 ft. In his detailed diagnosis [*Fragmenta* 1: 112 (1859)] the points wherein this montane plant differs from *P. mitchellii* [i.e. from *P. longipedata*] are emphasized—shorter peduncles, fewer larger less appressed phyllaries with longer obtuse laminae and glandular claws. Benthams [*Flora Aust.* 3: 604 (1866)] synonymized Mueller's *P. hieracioides* under *P. longipedata* with the remark that "northern specimens generally have an annual appearance, with smaller flower-heads than the southern ones", and stated further that R. Brown's specimens linked the two forms—he made no mention of the manifest differences between the phyllaries of *P. hieracioides* and *P. longipedata*.

I cannot agree with Benthams treatment (perpetuated in Ewart's *Flora of Victoria*, 1930). There is no difficulty in distinguishing these northern and southern populations, and I consider that the old name *P. hieracioides* should be restored for our tall many-headed montane *Podolepis* which extends at least as far as the Kosciusko region in New South Wales. Besides the earlier collections of Mueller, there are in Melbourne Herbarium more recent ones from the upper reaches of the Tambo, Delegate and Genoa Rivers; a specimen labelled "mouth of the Glenelg" (collected by Allitt) must surely be an intruder in its folder, which also contains a sample of northern *P. longipedata* purporting to come from the same area!

The epithet is most appropriate, for the smallish, campanulate to funnel-shaped heads are remarkably *Hieracium*-like. Sometimes the heads are exceedingly congested, in fascicles forming a long narrow interrupted panicle (e.g. Delatite material). A luxuriant specimen from the upper Snowy River, about three miles north of Hotel Kosciusko and at some 4,000 ft. elevation (leg. Dr. M. Mueller, No. 341, 6/2/1953), is almost 3 ft. high

and has a very broad, spreading panicle bearing about 60 capitula. More often the panicle consists of eight or more heads in a single terminal cluster. As LECTOTYPE I have chosen one of F. Mueller's specimens from the upper Macallister River (Jan. 1859), and as HOMOTYPE a very excellent example collected near Mt. Coopracambra (between the upper Cann and Genoa Rivers) by Dr. R. McVillie, No 2865, 13/1/1953—both specimens in the Melbourne Herbarium.

P. hieracoides must not be confused with the truly alpine, blunt-leaved and rosulate *P. robusta*, nor with several-headed forms of *P. jaccoides* (Sims) Druce—the correct name for *P. acuminata* R. Br. in Ait. of Ewart's *Flora* and other standard works—which may also enter highland country. *P. jaccoides* always has larger, more obtuse heads, with claws of the bracts shorter and hardly glandular. Several forms of it exist in Victoria, some with very large solitary golden-yellow heads, others with much paler heads flowering at a different time. It is possible that more than one species is involved, and the whole group needs a competent systematic revision.

EFFECTS OF TIGER SNAKE BITE

By IAN WALLACE

Throughout the summer months of 1953, my brother and I conducted snake demonstrations at the Sir Colin Mackenzie Sanctuary at Healesville. These demonstrations involved the handling of many hundreds of snakes, chiefly Tiger Snakes, Copperheads, Brown Snakes and Black Snakes. The object was to educate visitors in correct first aid, in case of snake bite, and to make them more familiar with these much-feared reptiles. It was during one of these demonstrations that, through my own carelessness, I was unfortunate enough to experience very severe effects of snake bite.

It was a warm March afternoon, when the usual procedure of catching snakes in a large rocky pit was under way. It so happened that the first snake I picked up, a Tiger Snake, was particularly lively. While I held it in my right hand prior to bagging it, it made a quick movement upwards, and in a flash had touched my thumb, disproving the theory that a snake is harmless while held by the tail.

I immediately granted the snake its freedom and examined my thumb. Believing that the fangs had only grazed the skin I squeezed and sucked the bite thoroughly; and there being only one mark on the skin I did not consider it worthy of first aid, and so carried on with the task of bagging snakes. It was in a matter of about two minutes that I realized my mistake.

My heart began to beat heavily, and there was a peculiar burning sensation in the mouth. At this stage a ligature was applied; but, according to the symptoms that followed, it was of little use. I was immediately assisted out of the pit, and walked with difficulty to the Sanctuary cottage. On my arrival vision was blurred, and in a matter of minutes complete loss of sight resulted, breathing became difficult, almost the entire palate was paralysed, and the throat became swollen.

It is due to the venom of the Tiger Snake being of a neurotoxic type, that is, affecting the nervous system, that a victim suffers breathing difficulties, loss of sight, and certain parts of the body become paralysed.

Approximately ten minutes after the bite speech was difficult and breathing was almost impossible as the lungs could be felt slowly paralysing. I believe it was only by being sufficiently conscious to inhale deeply at regular intervals and so fully inflate the lungs that it was possible to continue breathing. I feel certain that, should one go to sleep under such circumstances, it would be very difficult to avoid suffocation. Throughout the effects I would have had no difficulty in going to sleep, but this was purposely avoided.

It was impossible to drink, and swallowing was difficult. At this stage my thumb was opened with a lancet, and also Tiger Snake antivenine (3,000 units) was administered, but no pain was felt and I have no recollection of these being done.

The efficiency of the antivenine was rapidly proved. Within three minutes of its administration vision had cleared, although it was still slightly blurred, and breathing became easier, but the lungs were congested as if with asthma and remained so for about ninety minutes afterwards. The palate also remained numb for a short time, I felt sick and cold, but experienced none of the vomiting common with snake bite.

I had perspired profusely throughout the effects, but this had ceased following the antivenine injection. A severe headache followed, but on my arrival at the Royal Melbourne Hospital, after being rushed by ambulance from Healesville, my condition had greatly improved, and two hours later I felt almost normal.

I was held under observation for twenty-four hours before being discharged, and during that time my hand became very swollen. This was treated with injections as an infection, but in my opinion the swelling was not due to infection but inflammation. The latter is apparently common with many snake bites, especially those of the smaller Whip Snakes (*Denisonia* spp.). I have often experienced bites of these, but have had no ill-effects although severe swelling often results.

The effects I experienced would not necessarily apply to all victims alike, as much depends on the size of the snake, the amount of venom injected, how quickly first aid is administered and what resistance the victim has against the venom. Apparently, in my case, the fang had penetrated one of the smaller veins in my thumb, resulting in almost immediate symptoms.

MOISTURE SUCKING HABIT AMONGST AUSTRALIAN BUTTERFLIES

By A. N. BURNS, M.Sc., F.R.E.S.*

I was greatly interested in the note entitled "Butterflies on Mud", by my colleague and friend, Mr. Tarlton Rayment, which appeared in the January issue of the *Naturalist*.

Being a keen student of *Rhopalocera* I have observed this interesting phenomenon many times and in many places in Australia, and hope that a précis of these observations might lend added interest to Mr Rayment's note.

His observation of the Wanderer Butterfly (*Danaïda Plexippus* Fab.) in the vicinity of Morialta Falls, South Australia, adds another species to my already long list of butterflies which are attracted to moisture during very hot weather.

As Mr. Rayment states, it is not necessary to travel either to Oxfordshire in England or Grosso in Brazil to observe this interesting habit of some butterflies. During the great flight of the "Lemon Migrant" (*Catopsilia pomona pomona* Fab. *Pieridae*) in central Queensland during January 1924, thousands of these insects were to be seen imbibing moisture from damp sand along the edges of streams. Amongst these were numerous other species including the Migratory Skipper (*Badhamia exclamationis* Fab. *Hesperidae*), two species of the pretty little Bordered Sulphurs (*Eurema* spp. *Pieridae*), occasional Swallow Tails (mostly the Blue Fanny, *Papilio sarpedon choredon* Feld. *Papilionidae*) and several species of "Blues" or *Lycænidæ*. Of the last, by far the commonest was the "Forget-me-not" (*Catochrysops platiss* H. Sch.).

Later, during the same summer, and again the following summer, when the sun shone hotly after heavy falls of rain, many butterflies were to be seen round the edges of puddles by the roadside.

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In the summers of 1925 and 1926 when the writer was living near Cairns, it was usual to see quite a number of species of butterflies sucking moisture from pools and the edges of streams. In addition to the species already cited, several showy species of "Browns" (*Nymphalidae*) were often seen in very hot weather partaking of moisture. Most noteworthy amongst these were the males of the "Cruiser" (*Cynthia arsinoe* ad. Butl.). Females were never observed thuswise. During late March 1950 when the writer was visiting the same district, he encountered many examples, both male and female, of the pretty little "Cupid" (*Euchrysops cnejus cnejus* Whs. & Lyell *Lycacnidae*) at pools of water by the roadside at Barron Crossing. During that same visit, at Gordonvale, some fifteen miles south of Cairns, scores of Bordered Sulphurs (*Eurema* spp. *Pieridae*) were to be seen at the edge of every available small pool—no matter how muddy the water!

This interesting habit amongst butterflies may often be observed even in the suburbs of Brisbane. During very hot weather when the water cart has been along the roads, it is quite common to see specimens of the Blue Fanny (*Papilio sarpedon chorodon* Feld. *Papilionidae*) and more rarely the Pale Green Triangle (*Papilio eurypylus lyeon* West. *Papilionidae*) sucking moisture from small pools in the gutters.

During visits to northern New South Wales the writer has seen the same thing on numerous occasions. In January 1934 near Port Macquarie, on the day following a heavy thunderstorm, large numbers of the Common Albatross (*Appias paulina* ege Bois. *Pieridae*) were observed at pools; these were accompanied by examples of the small Common Blue (*Zizeeria labradus labradus* Godt. *Lycacnidae*) and the Common Grass Yellow (*Eurema hecabe sulphurea* Butl. *Pieridae*).

In Victoria, too, this moisture sucking habit amongst butterflies may sometimes be noted. During late December and January the writer has seen numbers of males of the Common Brown (*Heteronympha merope merope* Fab. *Satyridae*) and specimens of the Common Blue (*Zizeeria labradus labradus* Godt. *Lycacnidae*) on the damp sand by the edge of streams at Melton. Shade and cool moist conditions are apparently much sought after by many butterflies in excessively hot weather. Some years ago in January scores of Satyrid butterflies of several species were observed by the writer at Nowa Nowa, sheltering under the overhang of embankments bordering a small creek. Whilst thus resting they could very easily be approached and captured.

PAHRAN JUNIOR NATURALISTS CLUB

About 50 were present on February 16 at the first meeting for 1954 of the Pahrans Juniors. The Committee for the year was elected and consisted of Chairman, Secretary and three others. Miss Merie Day gave a very interesting talk and demonstration on collecting and mounting insects.

On March 16, Mr. A. A. Baker gave a talk on volcanoes, and 75 persons attended. On April 13, the subject for the evening will be "A Tour of East Gippsland", by Mr. N. A. Wakefield.

ERRATA

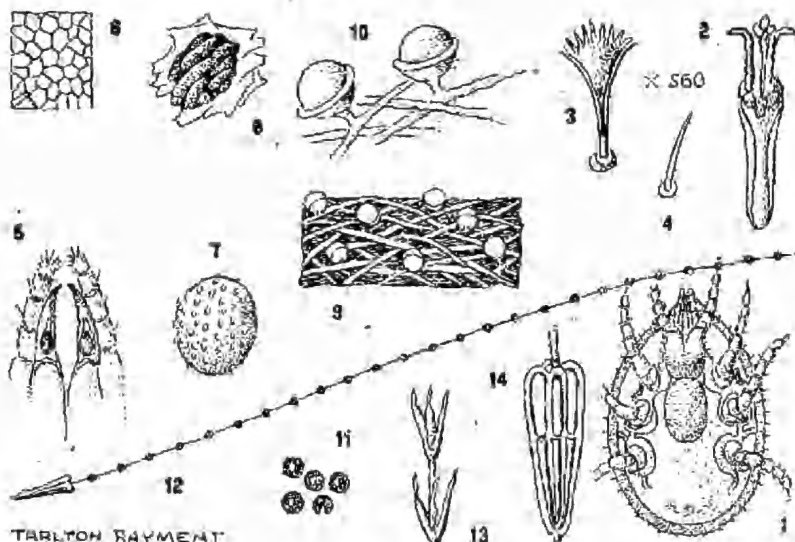
In the Printing of the paper entitled "Changes of Nomenclature of Certain Insects and Arachnids" in the *Vict. Nat.* of February 1954, the author's manuscript was departed from in some ways, including the wrong use of some capital letters in abbreviations of journals, the insertion of a number of commas in places in the second column, the omission of brackets in "*Lisopimpla excelsa* (Costa, (1862), 1864) Schulz, 1912" and in the incorrect spelling of *Sceliphron laetum*. Also the spelling of *Loemophloeus* should be corrected in the third column.

FUNGI AND BEES

By TARBTON RAYMENT, F.R.Z.S.*

A short but interesting paper (*Nature*, 153: 112, Jan. 1944) has just arrived (March 24, 1954) from Ronald Melville, who, it will be remembered, recently visited Australia. It is written in collaboration with H. A. Dade, of the Imperial Mycological Institute, Kew.

Describing a piece of partly decayed wood containing the remains of cells built by a leaf-cutter bee, *Megachile*, Dr. Melville says: "The pupa and pollen store were invested with a white mycelium in which small black fruiting bodies were observed. On examination the fungus proved to be *Pericystis opis* Maassen, the pathogen responsible for chalk-brood disease of the honey-bee. We are not aware of earlier records of this fungus attacking wild bees."



TARBTON RAYMENT

EXPLANATION OF TEXT-FIGURE

1, A reddish Uropodid mite, probably a new species of *Phaulodinyctus* taken from *Tertianus* pupae of *Halictus peraustralis* Ckll. 2, Claw segment of leg (x 560). 3, Round the body of the mite are 38 spatulate organs with a serrated margin (x 560). 4, One of the spines of the legs; the mites have few hairs. 5, Portion of the mouth-parts more highly magnified. 6, Sculpture of the median oval structure on the ventral surface of the mite. 7, Egg of the mite found on *Halictus leai* Ckll. 8, The stercoral pellets of the larvae of *H. leai*, often in a compact mass in a cast pellicle, are consumed by the mites. 9, The pollen-mat of *H. leai* Ckll. is often covered with the mycelia of a mould. 10, Two of the "green" fruiting-bodies of the mould much enlarged. 11, The spores are in purple-coloured cases (species not determined, but perhaps *Pericystis*). 12, Mites are often congregated in a "trass" of minute nodose "hairs" of the larvae of a museum pest (viewed by low power). 13, Two of the nodes highly magnified. 14, Basal structure of the "hair".

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In December, 1947, the author investigated the biology of *Halictus leai* Kell., collected by Owen Dawson, at Cranbourne, Victoria, but his notes were not published until 1954 (*Australian Zoologist*, Pt. I, March, p. 26, 1954).

"Microscopic study of five mites on a wild-bee that had large areas of its body growing a mould producing a purplish-black sporangium, showed that many of the mites had ingested a few of the sporangia. The author was unable to determine whether or not spores form portion of the normal diet of the mites."

It would be interesting to discover whether the fungus on the Australian *Halictus* is identical with that found by Dr. Melville on the English *Megachile*. The drawing may assist some mycologist to determine the species.

NEW LIGHT ON ANIMAL WAYS

(Book Review)

To understand the behaviour of any animal the student should invariably walk "cheek by jowl" with it; nay, more, he should live among its kind, and few behaviourists have done that so successfully as Doctor Konrad Z. Lorenz, of Altenberg, on the Austrian Danube—and not in cages, mind you! This naturalist's remarkable open air investigations have been translated from the German by Marjorie Kerr Wilson under the title of "King Solomon's Ring", and the book thoroughly deserves the high encomiums bestowed on it by our own eminent Julian Huxley. All naturalists and philosophers should read this book.

Lorenz, a true scientist, repeatedly compares the reactions of his animals with those of man, in an informative and interesting style, and presents us with many uncommon angles that we would do well to incorporate in our own researches. It is impossible, in a short review of this kind, to cover adequately the extensive field cultivated by this naturalist, for he won the friendship of jackdaws, doves, cockatoos, dogs, hamsters, wolves and many other animals; and he ornaments margins with numbers of amusing but nevertheless naively clever thumbnail sketches that a reader thoroughly enjoys.

This reviewer found the chapter on "Morals and Weapons" exceedingly thought-provoking. Lorenz stresses the fact that the weapons of a species govern very largely the behaviour with its fellows, and points out that only one, man, has been able to arm himself with horrible weapons that are not his own by natural inheritance. Consequently, man's behaviour in modern warfare does not conform with the natural inhibitions of other animals in combat. This reviewer admits, ruefully enough, that he cannot share the author's optimism in the future behaviour of mankind when once war is declared—or, perhaps, in peace.

Quotation at this juncture is unavoidable: "I think it a truly magnificent thing that one wolf finds himself unable to bite the proffered neck of another, but still more so that the other relies upon him for this amazing restraint". This reviewer has repeatedly witnessed two queen bees locked in combat, so that each could deliver a fatal sting to the adversary. But on the instant the posture of extermination is attained, both insects immediately break away without effecting the *coup de grace*. The future of the species is threatened; the race must not be exterminated.

That merciful behaviour is the common inheritance of the social animals, but not man. It is the basis of the plea for mercy by the weaker warrior—the sword is lowered in submission. That was for the ancients. To-day it is futile for the innocent and the weak ones in a city to pray for mercy; the atom bomb will inevitably fall and reduce the just and the unjust to elemental dust.

—TAKLTON RAYMENT.

NATURALISTS' NOTEBOOK

(Reserved for your Notes, Observations and Queries)

FOX AND WALLABY

In the *Vich. Nat.* of March 1954, Mr. Leo Hodge commented on the dingo's method of hunting wallabies. Following is a note concerning an attempt by the introduced fox to emulate the dingo in this regard. I was out along the Genoa River at Wangrabelle very early one morning during the Easter of 1940, when my attention was attracted by movement on a sandbank about 150 yards upstream. A Swamp Wallaby was hopping slowly about followed by a smaller animal which was thought to be a "joey". A second look indicated it to be a dog of some kind and the natural supposition was that it was a dingo. However, on approaching closer I was surprised to see that it was a fox, full grown but still quite small compared with the wallaby. The fox became aware of the observer and slipped across a shallow arm of a lagoon and into cover while the wallaby took to the water. The latter was a stocky animal about three feet high and sat hunched up in only about nine inches depth of water, obviously quite exhausted. The maze of tracks on the sandbank told a story of perhaps an hour of slow flight and relentless pursuit. The fox had apparently succeeded in exhausting the wallaby as much by fear as by exertion, and one wonders what would have been the outcome of the little drama had it not been disturbed.

—N. A. WAKEFIELD.

SPARROWS ARE CRUEL BIRDS

A friend who lives at Hampton, a bayside suburb of Melbourne, has a brick porch over the entrance to his house. The opening to the porch is in the form of a Roman arch; and for several years—perhaps ten or so—a pair of swallows have spent much time darting through this arch to attend to a mud nest built on a small wooden shelf over the electric meter.

My friend encouraged and protected the swallows which, he says, are the original pair. A kind of friendship has developed between them, and each year the birds return to the same nest at approximately the same time, and are not disturbed at his proximity.

One year, a cat learned how to reach the shelf, and ate the entire brood. My friend then erected a wire barrage that effectually excluded the cats, but permitted the swallows to pass through readily. This year he was thoroughly shocked when a cock-sparrow flew into the nest, and when the young swallows opened their gapes to receive the anticipated food, the sparrow plucked out the tender tongues of the nestlings and swallowed them. The brood died.

—TARLTON RAYMENT.

WHAT, WHERE AND WHEN

Sunday, May 2—Koomhala, Olinda, 4-mile walk. Subject: Autumn Foliage and Vistas. Take 8.55 a.m. Upper Ferntree Gully train, then Monbulk bus, alight at Nathalia Springs. Bring one meal.

Saturday, May 8—Geology Group Excursion to Black Rock. Subject: Erosion Survey. Take 1.45 p.m. Sandringham train, then Beaumaris bus to Half Moon Bay. Meet 2.30 p.m. at pier.

Group Fixtures

Tuesday, May 4—Geology Group Meeting. Ring Group Secretary for details of meeting place.

—KENNETH W. ATKINS, Excursion Secretary.